

# Curriculum Vitae

## Aline CARNEIRO VIANA

### 1) Coordonnées Professionnelle / *Professional coordinates*

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### 2) Parcours professionnel / *Professional history*

Dates début / <i>Start</i>	Dates fin / <i>End</i>	Établissements / <i>Institutions</i>	Fonctions et statuts <sup>2</sup> / <i>Positions and status<sup>2</sup></i>
Oct. 2006	to date	Inria Saclay, France	CR1 (CRCN since 2018) ↔ Head of TRiBE (2019, previously INFINE-POST) ↔ Head of INFINE-POST (Feb. 2018-Jan.2019) Previous teams: INFINE (2014-2018), HIPERCOM (2011-2012), ASAP (2006-2009)
Jan. 2013	to date	LINCS <sup>1</sup> , France	Associate member
Nov. 2009	Oct. 2010	Technische Universität Berlin, Germany	Visiting scholar (Inria sabbatical year)
Oct. 2005	Sep. 2006	Inria Rennes, France	Inria Postdoctoral Fellow
Jan. 2002	Jul. 2005	LIP6/UPMC, Paris, France	PhD student
1998	2000	Apice Telemática, Brazil	Start-up funder

### 3) Diplômes / *Education*

Dates début / <i>Start</i>	Dates fin / <i>End</i>	Établissements / <i>Institutions</i>	Fonctions et statuts <sup>2</sup> / <i>Positions and status<sup>2</sup></i>
Dec. 2011	Dec. 2011	UPMC, Paris, France	HDR
Jan. 2002	Jul. 2005	LIP6/UPMC, Paris, France	PhD in Computer Science
1999	2001	Federal Univ. of Goiás (UFG), Brazil Federal Univ. of Rio de Janeiro (UFRJ)	M.Sc. in Electrical Engineering
1994	1998	Federal Univ. of Goiás (UFG), Brazil	B.Sc. in Computer Science
1990	1993	Technical High School (CEFET), Brazil	Technical High school in Telecommunication

### 4) Interruptions de carrière/*Career breaks*

Date début <i>Start</i>	Date fin <i>End</i>	Motif de l'interruption/ <i>Reason for interruption</i>
Sep. 10, 2012 Sep. 27, 2015	Dec. 30, 2012 Mar. 5, 2016	Maternity Leave Maternity Leave

### 5) Prix et distinctions / *Prizes and awards*

- **Nominated “10 women in networking/communications that you should WATCH”<sup>23</sup>** in 2016 by Networking Networking Women (N2Women) community (a discipline-specific community for researchers in the communications and networking research fields); N2Women is an ACM SIGMOBILE program, supported by the IEEE Communications Society, ACM SIGCOMM, IEEE Computer Science TCCC, CRA-W, Facebook, and NSF.
- **Top-three best paper award**, ACM MSWIM 2013 [89]
- **Selected papers** for fast track journal publication:

<sup>2</sup><http://n2women.comsoc.org/10-women-in-networkingcommunications-that-you-should-know/>

<sup>3</sup><https://www.inria.fr/en/centre/saclay/news/aline-carneiro-viana-portrait-of-a-researcher>

- ACM MSWiM 2013 → *Elsevier Performance Evaluation Journal* (two papers) [50, 89].
- IFIP Home Networking Conference 2007 (IHN) → *Springer Annals of Telecommunications* [66].
- IEEE PERCOM 2003 → *ACM/Springer Wireless Networks Journal* [94].

## 6) Encadrement d'activités de recherche / *Supervision of research activities*

I had the pleasure to work with students and post-doc fellows with different background/experiences, from different locations, and with different culture. They all helped me progress as a researcher: through the opportunity to advise them or through collaborations, they contributed to my maturity as a researcher. For all this, I claim the provided synthesis and the achieved successes of my carrier work (form 2 and 3) are also theirs.

### Post-doctoral fellows (7):

1. **Sahar Hoitet** (Jan.-Sep. 2015). *From*: CentraleSupélec. *Topic*: Temporal completion of sparse call detail records (CDRs) datasets for mobility analysis [25]. *Collaborators*: M. Fiore (CNR). *Current position*: MdC L2S/CentraleSupélec.
2. **Diego P. Paramo** (2014-2015). *From*: Polytechnic University of Valencia, Spain. *Topic*: Adaptation of Topology-Based Routing Protocols for Data Gathering Applications in VANETs [62]. *Collaborators*: D. Koffman and L. Iannone (Telecom ParisTech/LINCS), J. P. Vasseur and G. Mermoud (CISCO).
3. **K. P. Naveen** (2014-2015). *From*: Indian Institute of Science, Bangalore, India . *Topic*: Wireless content caching optimization [38, 60]. *Collaborators*: L. Massoulie, E. Baccelli (Inria). *Current position*: Assistant Prof. IIT Kanpur.
4. **M. Sukru Kuran** (2013-2014). *From*: Bogazici University, Istanbul, Turkey. *Topic*: Improvement of vehicles recharging by routine-aware scheduling [40, 39]. *Collaborators*: D. Koffman and L. Iannone (Telecom ParisTech/LINCS), J. P. Vasseur and G. Mermoud (CISCO). *Current position*: Assistant Prof. at Abdullah Gül University.
5. **Massimo Vecchio** (2009-2010). *From*: IMT Institute for Advanced Studies, Lucca, Italy. *Topic*: Distributed Hash Table (DHT)-based self-organizing stock management network [6, 100]. *Collaborators*: N. Mitton (Inria). *Current position*: Associate Prof. at Univ. degli Studi eCampus, Italy.
6. **Golnaz Karbaschir** (2009-2010). *From*: LIP6/Univ. of Pierre et Marie Curie. *Topic*: Delay fairness for multiple network coding transmissions in interest-based mobile networks [28, 29, 30] *Collaborators*: K. Al Agha and S. Martin (LRI/Univ. Paris 11). *Current position*: In-Car MultiMedia Services and Connectivity.
7. **Cigdem Sengul** (2007-2008). *From*: University of Illinois, Urbana-Champaign, USA. *Topic*: Adaptative forwarding in intermittent connected networks [73, 74, 75]. *Collaborators*: R. Friedman (Technion), M. Bertier (INSA Rennes), and A.-M. Kermarrec (Inria). *Current position*: Senior Lecturer at Oxford Brookes University

### PhD students (17):

1. **Diego Madriaga** (Jan. 2019, on-going); NIC Lab/University of Chile, Chile;  
*Supervision*: 50% (jointly with Javier Bustos from NIC Lab/University of Chile, Chile);  
*Topic*: "Knowledge extraction from big data represented as time series" ;  
*Goal*: Time series can capture the time evolution of any type of data. Here, the focus is on time series generated from trajectories of mobile individuals. The goal is to identify motifs and extract changes in such motifs;  
*Originality*: Fine-grained and short-term human mobility has still a lot to be studied since majority of works in the literature consider long-term and granular mobility of individuals. Our approach will be able to capture particularities of fine-grained and short-term mobility, which will be very useful for on-line prediction based on a short history of movement of individuals;
2. **Lucas Santos** (Mai 2018 – to date); *Supervision*: 40%; (jointly with Pedro O. Vaz de Melo, UFMG, Brazil);  
*Topic*: "Investigating causalities in habits of human visits";  
*Goal*: To be able to infer how visits of points of interests are influenced by visits of surrounding locations. For this, flows of in-coming and out-going people at points of interests of several cities will be studied;  
*Originality*: Causality is still an open topic in the literature, which is hard to measure and with few consensus on how it can be measured. Here, we bring the causality study to geographic visiting context: we intend to formalise the way it can be measured in this context and be able to infer dependencies of visits among locations
3. **Douglas Teixeira** (Nov. 2018 – to date); *Supervision*: 50% (jointly with Jussara Almeida, UFMG, Brazil);  
*Topic*: "Context-enhanced human predictability in short-term datasets with high spatial resolution";  
*Joint PhD*: Ecole Polytechnique, France and Federal Univ. of Minas Gerais (UFMG), Brazil. CAPES Grant;  
*Goal*: To investigate entropy of human movements from fine-grained mobility datasets;  
*Originality*: We intend to study mobility entropy and predictability when considering daily (short-term) mobility as well as more granular datasets. Although interesting, properties of underlying large-scale mobility patterns unravelled by literature were made when capturing the long-term mobility behavior of individuals or when using sparse (in space) and coarse (in time) datasets.

4. **Licia Amichi** (Sep. 2018 – to date); *Supervision*: 100% (Ecole Polytechnique, France. Inria CORDI-S);  
*Topic*: “Modeling exploration factor of human beings”;  
*Goal*: To be able to identify: individuals with high tendency to be expèlorers, the period of the day when they like to explore, and probable geographic regions mostly visited while exploring. This will be then used to adapt prediction approaches;  
*Originality*: For the first time in the literature, we intend to identify explorers and to characterize the spatiotemporal features of their exploring movements. This characterization will then be leveraged in prediction mechanisms enhanced to consider contextual information as well as exploration factors of individuals.
5. **João Batista Borges** (Nov. 2018 – to date).; *Supervision*: 20% (jointly with Antonio F. Loureiro, UFMG, Brazil);  
*Topic*: “Revealing motifs in human mobility”;  
*Goal*: To extract motifs of mobility patterns of individuals that, when merged together, describe their daily motion and can be used to enhance mobility prediction;  
*Originality*: Motifs will be investigated when using datasets that describe fine-grained mobility of users (i.e., GPS coordinates instead of Cell coordinates as usually used in the literature). Besides, we will use the Bandt-Pompe (BP) transformation to capture time series dynamic, from deterministic to completely random behaviors. We will consider a multivariate time series, by taking into account latitude and longitude jointly. Both techniques have not been applied in the context of mobility studies.
6. **Emanuel Lima** (Oct. 2017 – to date); *Supervision*: 30% (jointly with Ana Aguiar, Univ. Porto, Portugal);  
*Goal*: Design of a device-centric decision strategy for future data offloading from mobile crowdsensed datasets of passive WiFi scans;  
*Originality*: To enable mobile devices to locally and efficiently take (i.e., where and when) future offloading decisions to WiFi infrastructure. It requires distributed and unsupervised learning of spatiotemporal connectivity zones;  
*Publications*: [41].
7. **Adriano Di Luzio** (Jun. 2017 – to date); *Supervision*: 20% (jointly with Julinda Stefa, Sapienza Univ. of Rome, Italy and Katia Jaffres-Runser, Univ. of Toulouse, France);  
*Goal*: Classification and extraction of personality traits from smartphone crowdsensed datasets;  
*Originality*: The establishment of a link between personality (e.g., being sociable and highly mobile, appreciating a variety of content, etc) and technological (e.g., “where”, “how”, and “for what” she uses her phone) behavior is a scientific discovery that will lead to wealth of design opportunities;  
*Publications*: [4]
8. **Rafael L. Costa** (Jun. 2017 – to date); *Supervision*: 50% (jointly with Leobino Sampaio, UFBA, and Artur Ziviani, LNCC, Brazil);  
*Joint PhD*: Ecole Polytechnique, France and Federal Univ. of Bahia (UFBA), Brazil. Brazilian CAPES Grant;  
*Topic*: “Human-enhanced forwarding strategies for Device-to-Device (D2D) communication”;  
*Goal*: Design of forwarding strategies for data offloading through Device-to-Device (D2D) communication, transforming mobile phone neighbors in service providers;  
*Originality*: The selection of next hops based on mobility behavior, resource capability as well as collaboration interests of mobile phone users. A real-world dataset collected in the context of EU CHIST-ERA MACACO project brings real data on these features, strengthen realistic validation of the strategy. *Publications*: [42] is under submission and Tutorial “*Humanos no ciclo de Comunica ção.*”at SBRC 2018.
9. **Guangshuo Chen** (2014 – 2018). Ecole Polytechnique, France. Chinese CSC Grant;  
*Supervision*: 80% (jointly with Marco Fiore, CNR, Italy) ;  
*Thesis title*: Human Habits Investigation: from Mobility Reconstruction to Mobile Traffic Prediction;  
*Goal*: (1) Spatio-temporal content demand prediction of mobile users and (2) temporal completion of users’ trajectories extracted from sparse and heterogeneous traffic-oriented datasets, which are used in the prediction analysis due to their large population;  
*Originality*: (1) 1st work presenting analysis on how per-user regularity of mobile data traffic is translated into actual predictability and the associated impacts brought by users’ visited locations. (2) 1st adaptive approach for trajectory completion in nighttime and daytime mobility of users. Refer to Fiches 1 and 3 of Form 3;  
*Publications*: [7, 8, 9, 10, 11, 12, 13, 14, 25]; [15] is under submission to EPJ Data Science.  
*Current position*: Data Scientist at eBay.
10. **Roni Shigueta** (2013 – 2018); *Supervision*: 50% (jointly with Mauro Fonseca – UTFPR, Brazil);  
*Joint PhD*: Ecole Polytechnique, France and PUC-PR, Brazil;  
*Thesis title*: Channel resource allocation of wireless interfaces of mobile devices;  
*Goal*: To allocate channels to interfering wireless mobile devices;  
*Originality*: The leveraging of user mobility associated with traffic history and node popularity to guide the channel allocation process in wireless networks, while quickly responding to changes in the network topology;  
*Publications*: [76, 77, 78];  
*Current position*: Associate Professor at University Catholic of Paraná Brazil.

11. **Felipe D. da Cunha** (2012 – 2016); *Supervision*: 50% (jointly with Antonio F. Loureiro, UFMG, Brazil);  
*Thesis title*: Exploring interactions in Vehicular Wireless Networks;  
*Goal*: To leverage drivers' mobility and spatio-temporal routines at the design of socially inspired data dissemination for Vehicular Networks (VANETs);  
*Originality*: Extraction of repetitive patterns among interactions in daily routine of metropolitan drivers. This knowledge was exploited and enhanced performance of literature works on data dissemination, determining when and which vehicles should broadcast data messages;  
*Publications*: [17, 18, 19, 20, 21, 22, 23];  
*Current position*: Associate Professor at PUC-MG, Brazil.
12. **Eduardo Oliveira Mucelli** (2011 – 2015); *Supervision*: 100%;  
*Thesis title*: From human routine to more efficient mobile networks;  
*Goal*: WiFi hotspot deployment in urban scenarios that consider density spread of population, their mobility patterns as well as traffic demand;  
*Originality*: The first thesis work (1) unveiling persistent traits present in an individual's urban mobility (people's tendency to revisit few favorite venues using the shortest-path available) using a large variety of heterogeneous datasets; (2) presenting a per-user mobile traffic profiling methodology as well as a synthetic data traffic generator that consistently imitates real mobile traffic behavior: the *Synthetic Mobile Data Traffic Generator (MDTGen)*, available at <http://macaco.inria.fr/software/> and used by the PhD student Vinícius Braga; (3) designing WiFi hotspots deployment strategy that leverages both mobility patterns and traffic demand of mobile users. Refer to **Fiches 1 and 2 of Form 3** for further details);  
*Publications*: [54, 55, 56, 57, 58, 59];  
*Current position*: Research Engineer at Blablacar, France.
13. **Guilherme M. de Menezes** (2010 – 2013); *Supervision*: 40% (jointly with Antonio F. Loureiro, UFMG, Brazil);  
*Thesis title*: Data dissemination solutions for wireless ad hoc networks;  
*Goal*: To answer the challenges of how to effectively distribute (1) monitored data in static wireless sensor networks such that data can be retrieved later by an entity that freely moves while traversing the network; and (2) report events to drivers who are inside a region of interest in highways or urban Vehicular Networks (VANETs);  
*Originality*: (1) The proposal of replication structures responsible for the sensed data distribution through the network according to probabilistic decisions of forwarding and storage (cf. **Fiche 4 of Form 3** for more detail). (2) While most existing solutions solely focus on dense and connected scenarios, our dissemination solutions in VANETs seamlessly adapt to the perceived road traffic conditions to deliver messages to intended recipients, operating in connected and intermittently connected VANETs;  
*Publications*: [43, 44, 45, 46, 47, 48, 51];  
*Award*: The [44] paper was one of the top-five papers recommended to be published at a special issue of PEVA Elsevier journal [51];  
*Current position*: Associate Professor at UFMG, Brazil.
14. **Ana C. B. K. Vendramin** (2009 – 2012); *Supervision*: 30% (jointly with Anelise Munaretto and Myriam R. Delgado, UTFPR, Brazil).  
*Thesis title*: Routing protocols based on swarm intelligence for Delay Tolerant Networks;  
*Goal*: To leverage the adaptive features of population-based paradigms (e.g., Ant Colony Optimization - ACO) in forwarding solutions for dealing with the dynamic and complex environment of Delay Tolerant Networks. (DTNs);  
*Originality*: The 1st routing solutions that employs a complete Ant Colony Optimization search (guided by pheromone and heuristics function) and analyzes the most relevant information that can be gathered from DTN nodes;  
*Publications*: [37, 91, 92, 93];  
*Current position*: Associate Professor at UTFPR, Brazil.
15. **Niels Karowski** (2009 – 2011); *Supervision*: 70% (jointly with Adam Wolisz, TU-Berlin, Germany);  
*Goal*: Fast neighborhood passive discovery in constraint multi-radio beacon-enabled wireless environments;  
*Originality*: 1st work to provide listening schedule solutions to the asynchronous and multi-channel passive discovery problem. Our solutions decrease the time to discover the first neighbor and reduce the average time compared to related approaches;  
*Publications*: [31, 32].
16. **Mubashir H. Rehmani** (2009 – 2011); *Supervision*: 80% (jointly with Hicham Khalife, Thales, France);  
*Thesis title*: Opportunistic data dissemination in multi-hop Cognitive Radio Ad-Hoc Networks; *Goal*: The design of a distributed channel selection strategy for robust data dissemination in multi-hop cognitive radio ad-hoc networks;  
*Originality*: Proposed strategy allows to efficiently and reliably take channel selection decisions on-the-fly and to recover from bad channel selection decisions, by keeping track of previous wrong channel state prediction and accordingly adapting to future channel selection decision;  
*Publications*: [68, 69, 70, 71, 72];  
*Current position*: Assistant Lecturer at the Department of Computer Science, Cork Institute of Technology, Ireland.
17. **Joseph Rahmé** (2007 – 2010); *Supervision*: 40% (jointly with Khaldoun Al Agha, Univ. Paris-Sud, France);

*Thesis title:* Constraints Modeling and Energy Management in Multi-Hop Wireless Network;  
*Goal:* Lifetime extension of wireless sensor network functionalities by avoiding energy-compromised hotspots in the network;  
*Originality:* Efficient combination of energy management mechanisms of sensors and load distribution over the network;  
*Publications:* [65, 66];  
*Award:* [65] was a top-rated papers recommended to be published at the Springer Annals of Telecommunication [66];  
*Current position:* Project manager at Groupe Caisse des Dépôts.

**Visiting PhD Interns (7):** Students who, during their PhD studies at their home institutions, came to Inria for 4 to 6 months.

1. **Panagiota Katsikouli** (May 2016 – Sep. 2016). Univ. of Edinburgh, UK;  
*Supervision:* 50% (jointly with Marco Fiore and Alberto Tarabe from CNR, Italy);  
*Goal:* What frequency should one sample individual human movements so that they can be reconstructed from the collected samples with minimum loss of information?  
*Originality:* To preserve the temporal dimension of movements and the time ordering of visits, while capturing transitions between frequent locations. Our quest for a response leads to the discovery of (i) seemingly universal information-theoretical properties of human mobility, and (ii) a linear scaling law of the localisation error with respect to the sampling frequency. Based on such knowledge discovery, we have designed an adaptive sampling approach that adapts according to the speed of movement of individuals. The approach is currently being tested on 8 smartphones of volunteers;  
*Publication:* [33, 34]; **Patent:** We have also started with Inria the procedure to register a patent on the adaptive sampling approach, which we believe has a big potential on any application or service leveraging mobility;  
*Current position:* Post-Doc fellow at AGORA/Inria Lyon.
2. **Thiago Silva** (Jun. 2013 – Sep. 2013) Federal Univ. of Minas Gerais (UFMG), Brazil;  
*Supervision:* 50% (jointly with Antonio F. Loureiro and Pedro Olmo S. V. de Melo, UFMG, Brazil);  
*Goal:* Characterization of properties of Waze application its broad and global spatial coverage as well as its limitations;  
*Novelty:* 1st characterization of Waze from a crowdsensing point of view: we show it can be exploited for mapping the physical features of urban locations at a low cost, providing complementary data in relation to location or photo sharing system;  
*Publications:* [79, 80];  
*Current position:* Associate professor at Technological Federal Univ. of Paraná, Brazil.
3. **Kanchana Thilakarathna** (Apr. - Oct. 2012). NICTA & UNSW, Australia;  
**Supervision:** 80% (jointly with Aruna Seneviratne and Henrik Petander, NICTA & UNSW, Australia);  
*Goal:* Dissemination of delay tolerant content in intermittently connected wireless networks;  
*Novelty:* The design of a hybrid time-aware method that (1) combines the advantages of distributed decentralized storage and opportunistic communications, (2) considers initial encounter time and duration of users' encounters (which we were the first to consider, to the best of our knowledge), and (3) allow users to share information/content only with the users who are previously identified as friends;  
*Publications:* [82, 84, 85, 83];  
**Awards:** Best Demo Award at IEEE iToF 2013 Demo and Poster Competition with the Yalut cloud service smartphone demo application ([www.yalut.com](http://www.yalut.com)) [27]. Best Thesis Award with "Malcolm Chaikin Prize" for Research Excellence in Engineering at UNSW for 2015;  
*Current position:* Assistant professor at University of Sydney.
4. **Pedro Olmo S. Vaz de Melo** (Mar. 2011 – Jul. 2011). Federal Univ. of Minas Gerais (UFMG), Brazil;  
*Supervision:* 40% (jointly with M. Fiore, CNR, K. Jaffrés-Runser, Univ. of Toulouse, and A. F. Loureiro, UFMG);  
*Goal:* The design of a classifier of users' wireless interactions, able to clearly characterize random interactions and to identify social interactions (i.e., Friends, Acquaintances, Bridges nodes);  
*Novelty:* First work to propose such finer grained classifier without imposing any geographical dependency, what gives it general validity;  
*Publications:* [61, 88, 89];  
**Award:** [89] was (1) top-three best paper award and (2) top-five selected paper recommended to be published at a special issue of PEVA Elsevier journal [61] (among 42 full papers);  
*Current position:* Associate Prof. at UFMG, Brazil.
5. **Greg Bigwood** (Mar. 2009 – Aug. 2009). Univ. of St. Andrews, UK. Inria Grant;  
*Supervision:* 80% (jointly with Marcelo Dias de Amorim); *Goal:* Centrality-based data collection strategies for wireless disconnected networks, leveraging inherent encounters of mobile phone users and transforming some of them into delegates for data collection;  
*Novelty:* Selection of a subset of central devices to play the role of collectors in the network, while keeping their normal mobility behavior (no mobility-assisted or controlled-mobile special devices are used);

*Publication:* [2, 3];

*Current position:* Software Developer at Springer Nature.

6. **Massimo Vecchio** (Oct. 2008 – Feb. 2009), IMP Institute for Advanced Studies, Italy;  
*Supervision:* 80% (jointly with Artur Ziviani, LNCC, Brazil, and Roy Friedman, Technion, Israel);  
*Goal:* Design of a dissemination strategy allowing a mobile sink to effectively gather, with a low communication overhead, a representative view of a monitored region covered by  $n$  sensor nodes by visiting in an uncontrolled trajectory any  $x$  nodes, where  $x \ll n$ ;  
*Novelty:* 1st work to provide solution to this problem: our strategy combines a probabilistic flooding with a probabilistic storing scheme to uniformly distribute data among nodes in Wireless Sensor Networks (cf. **Fiche 4 of Form 3** for more details);  
*Publication:* [90];  
*Current position:* Associate Prof. at Univ. degli Studi eCampus, Italy.
7. **Antonis Papadimitriou** (Mar. 2008 – Jul. 2008), National & Kapodistrian University of Athens, Greece;  
*Supervision:* 40% (jointly with Fabrice Le Fessant, Inria, and Cigdem Sengul Post-Doc Inria);  
*Goal:* Investigating the impact of selective forwarding attacks on tree-based routing topologies in Wireless Sensor Networks (WSNs);  
*Originality:* Provision of continuous operation (or graceful degradation) of WSNs by improving resilience against, rather than detection of (focus of related works), these attacks: important property in environments where human intervention is difficult;  
*Publication:* [24, 63, 64];  
*Current position:* Security researcher at Intel Labs.

### **M.Sc. Intern (1):**

1. **Diego Madriaga** (Sep-Nov 2018, on-going); NIC Lab/University of Chile, Chile;  
*Supervision:* 70% (jointly with Marco Fiore, CNR, Italy, and Panagiota Katsikouli, Post-Doc AGORA Inria);  
*Topic:* “Adaptive mobility sampling: Real implementation and performance evaluation”;  
*Goal:* To implement as an Android application, our adaptive mobility sampling approach, started during the PhD internship of P. Katsikouli (here above described);  
*Originality:* No equivalent approach exists in the literature. Our approach captures trajectory of individuals with their temporal specificities in a limited frequency of sampling. The sampling frequency is adapted to the stationarity level of users;  
*Patent:* Started at Inria: it has a big potential on any application or service leveraging mobility (about 24% applications available at Android Play Store leverage users mobility in their services);

## **7) Responsabilités collectives / Responsibilities**

### **Commissions and Committees:**

- At Inria:
  - (since Sep. 2017) **Member of Bureau du CEP** (BCEP at Inria Saclay).
  - (since Oct. 2017) **President of “Commission Scientifique (CS)”** at Inria Saclay. Commission in charge of the ranking of candidates applying for a PhD scholarship, a Post-Doc fellowship, and “délégation” at Inria Saclay.
  - (since Dec. 2018) **Co-Coordinator of the mentoring program** at Inria Saclay.
  - (since Feb. 2017) Member of “Comité Parité/Égalité” (GT-profil internationaux) of Inria.
  - (Feb. 2017 - Dec. 2018) Member of “Comité Parité/Égalité” (GT-recrutement) of Inria.
  - (Apr. 2018) Member of “Comité d’arbitrage des détachements pour 2018”.
  - (since Jan. 2014) Member of “Commission Scientifique (CS) de Inria Saclay”.
  - (since Oct. 2013) Member of “Comité de Centre (CC)” of Inria Saclay (Collège A). Committee promoting the communication and transmission of information within the center to debate collective questions about the center and the professional life of the staff.
- At the regional eco-system:
  - (since Jan. 2015) Nominated member of “Pôle 2: Réseaux, information et communications” by the direction committee of Doctoral School STIC Paris Saclay (ED STIC of Univ. Paris Saclay). Committee responsible for the audition and ranking of candidates applying for a PhD scholarship at Pôle 2.
  - (2016) Member of the “STIC Doctoral School Best Scientific Contribution Award” committee.

- (2014-2015) Member of the working group named “*The researcher career in 2030*” of *Reseaux Prosper* (<http://www.reseau-prosper.org>, which regroups responsible for the strategy and the prospective of public research institutions in France). I was invited by Claude Kirchner to represent Inria (jointly with Julien Mairal) at that WG, which resulted in 6 meeting in Paris and a final report describing the prospective vision of possible futures for a researcher career in France.

- Other committees:

- (2019) Member of “Comité de sélection pour les recrutements d’un MdC à l’IUT, “Université Paris-Sud”.
- (2019) Member of “Comité de sélection pour les recrutements d’un MdC à “Université de Technologie de Compiègne”.
- (2018) Selected member by ACM-W to attend (with funding) the Grad Cohort program event (<https://cra.org/cra-w/events/grad-cohort-women-2018/>) in San Francisco (Apr. 2018) and represent the mentor community of women from Europe. Grad Cohort is an event of CRA-W (Computing Research Association Committee on Women).
- (2017) Member of “Comité de sélection pour les recrutements d’un MdC (27ème section) sur le département télécom et le laboratoire CITI de l’INSA de Lyon”.
- (2015) Member of “Comité de sélection pour les recrutements d’un MdC à l’IUT, “Université Paris-Sud”.
- (2011) Member of the XXIV Best PhD and M.Sc.Thesis Award of the Brazilian Computing Society (SBC) - CTD 2011.

#### Reviewer for the European Commission:

- (Mai 2019): Remote evaluator of ERC Starting Grant proposals 2019.
- (Feb.-Jun. 2013): Remote evaluator of FET Open "Xtrack" proposals.
- (Jan. 2011 - Jan. 2013): Remote evaluation of short proposals for the FET-Open program.
- (Jan. 2011): Rapporteur, Shadow and Challenger at the Panel evaluation of Grant proposals for the EC "Future and Emerging Technologies" program (EC FET-Open), in Brussels.

#### Editorial boards:

- (since Feb. 2018) **Editorial Board member** of *Urban Computing Spring book series* (<http://www.springer.com/series/15552>).
- (since May 2014) **Area editor** of *ACM SIGCOMM Computer Communication Review* – ACM CCR.
- (since Jun. 2016) **Editorial Board member** of *Wireless Communications and Mobile Computing*, an Open Access Journal of John Wiley & Sons and Hindawi.

#### Organizing committee member (26):

- **General/TPC co-chair:** Workshop on Big Social Data and Urban Computing (BIDU) jointly with VLDB 2019; Workshop on Urban Computing 2019 (UrbCom) jointly with DCOSS 2019; Algotel 2017 (conférence francophone sur les aspects algorithmiques appliquée aux problèmes des télécommunications); ACM CoNEXT 2013 Student Workshop; ACM HotPlanet 2012, jointly with ACM MobiSys 2012.
- **TPC co-chair:** Symposium on Selected Topics in Communications at IEEE/CIC ICC 2015.
- **TPC co-chair:** Shadow ACM Conext 2011, together with O. Bonaventure and C. Pelsser, aiming at providing an educational experience for young PhD graduates, post docs, and junior researchers by simulating a TPC meeting entitled to discuss some papers submitted to ACM Conext.
- **Publicity co-chair:** EWSN 2020; IEEE DCOSS 2018 and 2019; IEEE PICOM 2018; IEEE SECON 2015; ACM MobiCom 2014; IEEE SECON 2012; IEEE MASS 2010.
- **Student Travel Grant co-chair:** IEEE Infocom 2019; IEEE MiSeNet 2018 Workshop jointly with IEEE Infocom 2018; ACM SIGMOBILE N2Women 2014 Workshop; ExtremeCom 2012 (in co-operation with ACM/SIGCOMM and SBC); ExtremeCom 2011; MOBILITY 2011.
- **Publication co-chair:** ACM MobiCom 2015; EAI AdHocNets 2011.
- **Workshop co-chair:** IEEE SECON 2014.
- **Demo chair:** IEEE SECON 2013.
- **Local Arrangement co-chair:** ExtremeCom 2011.

#### Program committee member (39):

- **Conferences (21):** Member of Poster and Demo committee of ACM SIGCOMM 2015; IEEE SECON 2015 and 2012; IEEE LCN 2008; IEEE ICC 2016; IEEE WiMob 2014; IEEE MASS 2010; IEEE PIMRC 2009, 2008 and 2007; IFIP NTMS 2018, 2016 and 2015; IEEE AINA 2017; IEEE IFIP Wireless Days 2014; MOBILITY 2011; IEEE WOCN 2011; WiCON 2010; AUTONOMICS 2009; ACM CoNEXT Student Workshop 2008; IEEE IFIP Wireless Days 2014; MOBILITY 2011; IEEE WOCN 2011; WiCON 2010; AUTONOMICS 2009; ACM CoNEXT Student Workshop 2008.
- **Workshops (10):** Workshop on Urban Computing 2019 (UrbCom) jointly with DCROSS 2019; ACM HotPlanet 2013; Med-Hoc-Net 2013; WPerformance 2011; CARI 2010; BWNCP 2009; WGRS 2009 and 2008; IMAGINE 2008 and 2007; ACM CoNEXT 2007's Shadow TPC Member.
- **National events (8):** Algotel 2019, 2018, 2014, and 2009; SBRC Urban Computing (COURB) workshop 2018 and 2017; JDIR 2009 (Journées doctorales d'Informatique et réseaux); SBRC 2014 (Brazilian Symposium).

#### Reviewer activities:

- **Regular reviewer of several international journals:** ACM Sigcomm CCR; IEEE Trans. on Computers (TC); IEEE Trans. on Mobile Computing (TMC); IEEE Trans. on Parallel and Distributed Systems (TPDS); IEEE Trans. on Industrial Informatics (TII); IEEE Trans. on Vehicular Networks (TVC); IEEE Internet Computing; IEEE Wireless Communications Magazine; IEEE Communications Letters; IEEE Internet Computing; Ad Hoc Networks Elsevier; Computer Networks Elsevier; Computer Communications Elsevier; Pervasive Mobile Computing (PMC) Elsevier; Sustainable Computing and Informatics and Systems (SUSCOM) Elsevier.
- Author of several reference letters for candidates applying to various positions in Computer Science.

#### PhD thesis committee member (28):

- **Reviewer (Committees abroad are indicated with ★):**
  1. R. Teles, *Industrial IoT* (Univ. de Strasbourg, fin 2019).
  2. H. Chelle, *Contrôle de charge des réseaux IoT: D'une étude théorique à une implantation réelle* (INP/Univ. de Toulouse, Dec. 2018).
  3. Y. Zhou, *Clustering Nature of Base Stations and Traffic Demands in Cellular Networks and the Corresponding Caching and Multicast Strategies* (CentraleSupélec, Jul.2018).
  4. F. Coriat, *Géolocalisation et communication en situation de crise* (UPMC, Dec. 2018).
  5. W. Shuai, *Management of electric vehicle systems with self-interested actors* (Telecom Bretagne, Sep. 2016).
  6. F. Rebecchi, *Device-to-Device data offloading: from model to implementation* (UPMC/Thales, Sep. 2015).
  7. (★) N. R. Zema, *Spontaneous mobility and autonomous (Re)configuration techniques to support next generation networks* (Univ. of Reggio Calabria, Italy, Apr. 2015).
  8. (★) F. Aguiar Silva, *Content Delivery in Vehicular Ad Hoc Networks* (Federal Univ. of Minas Gerais, Brazil, Dec. 2014).
  9. R. Hu, *Algorithmes de dissémination épidémiques dans les réseaux a grande échelle : comparaison et adaptations aux topologies* (UPMC, Dec. 2013).
  10. T. Ducrocq *Auto-organisation des réseaux sans-fil multi-sauts dans les villes intelligentes* (Univ. des Sciences et Technologies de Lille, Nov. 2013).
  11. R. Hu, *Algorithmes de dissémination épidémiques dans les réseaux a grande échelle : comparaison et adaptations aux topologies* (UPMC, Dec. 2013).
  12. I. Amadou, *Routing protocols without neighbourhood knowledge for multi-hop wireless networks* (INSA Lyon, Sep. 2012).
  13. (★) N. Piroso, *Wireless Ad-Hoc Networks: from Sensing to Socializing* (Sapienza Univ. of Rome, Italy, Nov. 2011).
  14. (★) M. Vecchio, *Novel approaches to in-network processing for reducing power consumption in wireless sensor networks* (IMT Institute for Advanced Studies, Italy, Apr. 2009).
- **Examiner (Committees abroad are indicated with ★):**
  1. (★) S. Ha, (Univ. of Nottingham, UK, Dec 2019).
  2. J. Muñoz, *km-scale Industrial Networking* (UPMC/EVA Inria, Mar. 2019).
  3. A. Boubrima, *Deployment and Scheduling of Wireless Sensor Networks for Air Pollution Monitoring* (INSA-Lyon/AGORA Inria, Mar. 2019).
  4. (★) L. Pajević, *Performance Analysis of Opportunistic Content Spreading via Data-driven Mobility Modeling* (KTH, Sweden, Nov. 2018).
  5. S. Eddine Belouanas, *Dissemination de contenus populaires et tolérants au délai dans les réseaux cellulaires* (UPMC, Sep. 2017).
  6. A. Ellouze, *Mobile applications offloading in mobile Cloud environment* (Telecom ParisTech, Mar. 2017).
  7. (★) P. M. Salgueiro dos Santos, *Wireless protocols and channel estimation for data gathering with mobile nodes* (Univ. of Porto, Portugal, 2017).



8. M. Rekik, *Protocols for Smart Girds* (Univ. de Lille, Jul. 2016).
9. O. Iova, *Algorithms and Protocols for all-IP Wireless Sensor Networks in the Internet of Things* (Univ. de Strasbourg, Dec. 2014).
10. T. Phe-Neau, *Properties and impact of vicinity in mobile opportunistic networks* (UPMC, Jan. 2014).
11. (★) J. Batista Pinto Neto, *Um Modelo para Previsão do Volume de Contato em Redes Tolerantes a Atrasos e Desconexões: Uma Abordagem Quantitativa* (Federal Univ. of Amazonas, Brazil, Sep. 2011).
12. F. Khadar, *Contrôle de topologie dans les réseaux de capteurs : de la théorie à la pratique* (Univ. Lille 1, Dec. 2009).
13. P. B. Velloso, *A human-based trust model for ad hoc networks* (Committee head, UPMC, Jul. 2008).

• **Invited:**

1. Tanel Razafimandimby *Toward Internet of Heterogeneous Things: Wireless communication maintenance and efficient data sharing among devices* (Univ. of Lille 1, Oct. 2017).
2. Thiago H. Silva, *Large scale study of city dynamics and urban social behavior using participatory sensor networks* (UFMG, Brazil, May 2014).
3. Ana Cristina B. K. Vendramin, *Cultural GrAnt: A routing protocol based on swarm intelligence for Delay Tolerant Networks* (UTFPR, Brazil, Jun. 2012).

**PhD Mid-term examiner (7 committees):** J. Kamal, *Détection d'anomalies comportementales pour les systèmes de transport intelligents et coopératifs*, (TPT, Avr. 2019); Y. Du, *In-Network Collaborative Mobile Crowd Sensing: a Context-Aware Sensing Group Framework*, (UPMC/MIMOVE Inria, Mar. 2019); M. Sardara, *Large scale video delivery over Information Centric Networking*, (Cisco/TPT, Jun. 2018); M. Charfi, *Networking Functions for Smart Cities*, (Centrale-Supélec, Jun. 2018); I. D. Adamou, *Data Collection Networks for White Areas*, (CentraleSupélec, Jun. 2018); C. Bertier, *Importance relative des noeuds dans l'espace dans les graphes de contacts*, (Thales/UPMC, Avr. 2018); T. Duc Ha, *Allocation de ressources et association utilisateur/cellule optimisées pour les réseaux C-RAN* (Univ. Paris Sud, 2017); S. Eddine Belouanas, *Data Dissemination under heavy cellular constraints* (UPMC, Jun. 2015); T. Lucia Monteiro, *Algoritmos Distribuidos para Alocação de Canais em Redes Sem Fio* (PUC-PR, Brazil, Dec. 2010).

**M.Sc. thesis committee examiner (5 committees):** W. Z. Xavier, (PUC-MG, Minas Gerais, March 2019); B. Farias Fausto, *Um mecanismo de detecção e controle de congestionamento usando redes ad hoc veiculares sem infraestrutura* (Federal Univ. of Rio de Janeiro State, Oct. 2017); F. Silva Moraes, *Explorando Interações em Redes Sociais Online, Comunicação D2D e Estratégias de Cache para Uso Eficiente de Recursos em Redes Celulares* (Federal Univ. of Goiás, Brazil, Nov. 2016); J. J. M. Diaz, *MOCHA: A framework to characterize and compare mobility traces* (Federal Univ. of Minas Gerais, Brazil, Mar. 2015); D. F. Borges de Oliveira, *TCP-HPL: TCP para Redes sem Fio com Alta Taxa de Perdas* (PUC-PR, Brazil, Dec. 2010).

## 8) Management / Management

**Research team:**

- (since Jan. 2019) **Head of TRiBE** (ex-INFINE-POST) which stands for *inTeRnet BEyond the usual*: (1) presented at BCEP and CEP of Saclay in Nov and in Dec. 2018, respectively; (2) got the GO of the DGD-S on 22nd Jan. 2019; (3) had its long-version proposal and answers to the DGD-S comments submitted to the GT on 23th Jan. 2019; (4) answers to GT's comments will be presented at the CEP on 26th March 2019, if approved by BCEP. TRiBE (1) belongs to the Inria theme "Networks and Telecommunications, (2) contributes to the "Challenge no 11: Toward a trustworthy Internet of Everything" of the strategic plan of Inria, and (3) aims to contribute to the design of smart, unified, and tactful Internet edge networks.
- (since Feb. 2018) **Head of INFINE-POST** (ex-INFINE). Team: 3 Inria CRCN researchers, 1 research engineer, 5 PhD students, 2 Brazilian researchers in 1-year sabbatical (from summer 2019).
- (2014-2017) **Vice-head of INFINE**. I was responsible for (1) the first compilation/edition of the team long proposal after the reception of reviewers comments and feedback of my team colleagues; (2) the writing of the first version of the Inria RaWeb report of the team (in 2014) and the version of 2017; (3) the team meeting's schedule and organization with technical presentations; (4) the participation to the CEP at Inria Saclay and its report to the team.
- (since 2008) **Coordinator of the international Inria EMBRACE associated team**, which is the outcome of a long-term collaboration with three Brazilian institutions.

**Research projects:**

• **As coordinator:**

1. **ANR MITik** (2019-2021): *Under submission, 2nd phase. Mobility and contact traces from non-intrusive passive measurements. Partners: UPMC – Sorbonne Universités and Université de la Rochelle.*

2. **EMBRACE associated team of Inria** (2017-2019, Inria-FAPs in Brazil): *Leveraging human behavior and uncertainty in 5G networks to build robust resource allocation and services orchestration models* (<https://team.inria.fr/infine/embrace/>). Partners: Federal Univ. of Minas Gerais (UFMG), Federal Univ. of Goiás (UFG), Technological Federal Univ. of Paraná (UTFPR). Inria amount: 30,000 EUR. Total amount: 90,000 EUR.
  3. **EU CHIST-ERA MACACO** (2013-2017, 3 out of 15 projects were selected): *Mobile context-adaptive caching for content-centric networking* (<https://macaco.inria.fr/>). Partners: Univ. of College London (UK), SUPSI (Switzerland), Univ. of Toulouse, Inria, CNR (Italy), UFMG (Brazil). INRIA amount: 812,449.52 EUR. Total amount: 1,718,183.25 EUR.
  4. **PHC-PESSOA** (2015-2017). *Routine-based enhanced connectivity under user mobility*. Partner: Univ. of Coimbra, Portugal. Inria amount: 5,560 EUR.
  5. **STIC-AmSud UCOOL** (2014-2016): *Understanding and predicting human demanded content and mobility* (<https://team.inria.fr/dante/stic-amsud-ucool-project-accepted/>). Partners: Univ. of Santa Maria (Chile), Univ. of Buenos Aires (Argentina), Inria, Telecom SudParis, UTFPR (Brazil), PUC-PR (Brazil), LNCC (Brazil), GranData (Argentina). Inria amount: 18,000 EUR. Total amount: 68,600 EUR.
- **As partner:** (★ indicates participation as work package leader)
    1. (★) **EU CHIST-ERA GORILLAS** (2019-2021): *Under submission, 2nd phase. Orchestration big data pour l'intelligence en tant que service*. Partners: IMT Atlantique (France), Univ. of College London (UK), SUPSI (Switzerland), Univ. of Toulouse, Inria, CNR (Italy), NIC/Univ. of Chile (Chile), Palacky Univ. Olomouc (Czech Republic), HELLA (Czech Republic).
    2. (★) **STIC-AmSud MOTIF** (2017-2019). *Mobile phone sensing of human dynamics in techno-social environment* (<https://team.inria.fr/dante/stic-amsud-motif>). Partners: Univ. of Buenos Aires (Argentina), Inria and ENS-Lyon (France), LNCC (Brazil), UFMG (Brazil), PUC-MG (Brazil), GranData (Argentina). Inria amount: 9,000 EUR (1st year). Total amount: 33,000 EUR (1st year).
    3. (★) **STIC-Asie URSA** (2012-2014). *URban Sensing for Ads Networks* (<http://sns.i2r.a-star.edu.sg/?portfolio-type=ursa>). Partners: Telecom SudParis, Fu Jen Catholic Univ., Institute for Infocomm Research, Institut de la Francophonie pour l'Informatique. Inria amount: 9,000 EUR. Total amount: 60,000 EUR.
    4. **ANR VERSO SHAMAN** (2009-2012). *Self-organizing and healing architectures for malicious and adversarial network*. (<https://www-npa.lip6.fr/shaman/wiki/pmwiki.php>). Partners: UPMC, Inria, Univ. Sud-Paris, Univ. Paris 7, Orange Labs, Ecole Polytechnique, EPFL, Kent State Univ., Univ. of Toronto, Canada. ASAP/Inria amount: 134,000 EUR.
    5. (★) **PICOM ICOM** (2008-2010). *Infrastructure pour le COMmerce du futur*. (<https://raweb.inria.fr/rapportsactivite/RA2010/pops/uid56.html>) Partners: Declathon, La redoute, Orange, Arismore, France Telecom, La Poste, Auchan, GS1, Atos Origin, Inria (ASAP, POPS). ASAP/Inria amount: 125,285 EUR. Total amount: 2,142,680.91 EUR.
    6. **Digitelabs Quality of Service in wireless network** (2007-2009). Partner: University Paris Sud. ASAP/Inria amount: 52,200 EUR.
    7. **ANR RRRT SVP** (2006-2008). *Architecture ambiente pour la surveillance et la prevention* (<http://surveiller-prevenir.irisa.fr/>). Partners: CEA, ANACT, APHYCARE, Inria (ARES, PARIS, POPS, R2D2), UPMC, Univ. Rennes 2, Thales.

## 9) Collaborations, mobilité / Collaborations, visits

### Geographical mobility:

- Regular visits to TU-Berlin (2 weeks a month) during 2010-2011.
- One-year sabbatical at TKN team of TU-Berlin (Germany), during 2009-2010
- Short-visits: one-month at PUC-PR (Brazil) in 2010; two-weeks at Univ. of Waterloo (Canada) and at LNCC (Brazil) both in 2009.
- One-year Post-Doctoral at PARIS team of Inria Rennes, during 2005-2006.
- Arrival at LIP6/UPMC (France) for the doctoral studies in 2002.

↔ Since 2012, I have been only at INRIA Saclay. My mobility is limited, for the time being, by the fact that I have two very young children. I have however hosted many international visitors during this period:

- *European visitors:* Julinda Stefa (Sapienza Univ. of Rome, 3 months, 2017), Alessandro Mei (Sapienza Univ. of Rome, 3 days visit, 2017), Rik Sarkar (Univ. of Edingburgh, 3 days visit, 2017), Ana Aguiar (Univ. of Porto, several few days visits, 2017 and in 2018), Marco Fiore (CRN, several few days visits in 2017 and in 2018).

- *Non-European visitors*: Mark Crovella (Boston Univ., Jan. 2019), Sand L. Correa (Unirio, 1-year, 2019), Kleber V. Cardoso (Unirio, 1-year, 2019), Antonio F. Loureiro (UFMG, 3 months, 2018-2019), Artur Ziviani (LNCC, 5 months, 2008), Anelise Munaretto (UTFPR, 2 months, 2009 and 1 year, 2012-2013), Mauro Fonseca (PUC-PR, 1 year, 2012-2013), and Roy Friedman (Technion, 22nd Sep. 2016).

#### Thematical mobility:

- Adaptive services for wireless self-organizing networks (2002–2009) → Random Linear Network Coding in Wireless Networks (2008–2009) → Protocols and services for mobile and intermittently connected networks (2007–2014) → Characterization and analysis of human behavior (2014–now).

#### International Visibility:

- Nominated in 2016 as one of the “10 women in networking/communications that you should WATCH” by Networking Networking Women (N2Women) community an ACM SIGMOBILE program.
- 17 international collaborations in 7 different countries (2 past and 15 on-going: USA, Portugal, Italy, UK, Brazil, Australia, Israel).
- Committee member of 7 international PhD thesis, in 5 different countries (Italy, Sweden, UK, Portugal, Brazil).
- Regular invitations to participate in the organizing committees of top-notch international conferences and workshops (e.g., ACM MobiCom, IEEE Infocom, IEEE SECON, ACM Conext).
- Invited to be a keynote by international workshops and school organisers in 5 different countries (China, Brazil, Germany, UK, Uruguay, Portugal, Brazil).
- Invited to give talks in several international universities (China, UK, Italy, Germany, Portugal, Chile, Brazil).
- Member of three editorial boards: ACM Sigcomm Computer Communication review (CCR), Urban Computing Spring book series, and Wireless Communications and Mobile Computing from John Wiley & Sons and Hindawi.

#### Collaborations:

Hereafter, I list my main scientific collaborations, beside the PhD students, PhD interns, and Post-Doc fellows. The publication list with all collaborators can be also found in DBLP<sup>4</sup>.

##### • National (on-going):

1. **Ivaylo Petev** (CREST/CNRS), since 2018, (1) on investigation on the effects that the diffusion and use of smartphone devices have on the segregation of human interaction, (2) on enhancing prediction by incorporating such knowledge in models to predict individual interaction behaviors, (3) to guide intervention to identify specific contexts and social profiles where intervention can foster diversity in human interaction. *Involved PhD student*: (M.Sc.) Haron C. Fanteceli.
2. **Catuscia Palamidessi** (Inria Saclay), since 2018, on the investigation of privacy versus utility trade-off of protocols and services leveraging human mobility knowledge. *Involved PhD student*: Adriano Di Luzio.
3. **Marcelo Dias de Amorim** (CNRS/LIP6), since 2002, (1) on zone coverage in wireless sensor networks, (2) on opportunistic data offloading strategies in delay-tolerant challenged networks, and (3) on mobility pattern investigation of mobile users. *Outcomes*: 12 common publications; *Involved PhD student*: Greg Bigwood, Marco V. Barbera.
4. **Katia Jaffrès-Runser**, since 2014, (1) on the classification of wireless interactions of mobile users, (2) on the design of the MACACOApp application<sup>5</sup>, (3) on the classification and extraction of personality traits from smartphone crowdsensed datasets. MACACOApp is being used by users in Brazil and different countries in Europe. She is also authors of the [89] paper, one of three candidates for the best paper award and published at PEVA Elsevier journal. *Involved PhD student*: P. O. S. Vaz de Melo, and Adriano Di Luzio.

##### • International (on-going):

1. **Mark Crovella** (Boston University, USA, since 2019) on the investigation of exploration patterns on human mobility. This collaboration has just started and involves the PhD student L. Amichi; *Involved PhD students*: L. Amichi.
2. **Carlos Sarraute** (GranData company<sup>6</sup>, USA, since 2014) (1) on human mobility modeling, (2) on per-user network traffic profiling, (3) on the predictability of mobile data traffic consumption, and (4) on temporal completion of users' trajectories. Such works have involved two PhD thesis: E. Muccelli and G. Chen; *Outcomes*: 6 common publications and 1 under-submission paper journal; *Involved students*: (PhD) E. Muccelli, G. Chen, D. Teixeira, and (M.Sc.) Haron C. Fanteceli.

<sup>4</sup>[http://dblp.uni-trier.de/pers/hd/v/Viana:Aline\\_Carneiro](http://dblp.uni-trier.de/pers/hd/v/Viana:Aline_Carneiro)

<sup>5</sup><https://macaco.inria.fr/macacoapp/>

<sup>6</sup>[www.grandata.com](http://www.grandata.com)

3. **Marco Fiore** (CNR, Italy, since 2011) (1) on the classification of wireless interactions of mobile users, (2) on the spatio-temporal traffic demand prediction of mobile users, (3) on the temporal completion and reconstruction of users' trajectories, (4) on the adaptive mobility sampling of individuals. Paper [89] was one of three candidates for the best paper award and selected to be submitted to a special issue of PEVA Elsevier journal, which got accepted. The collaboration and some outcomes involves the PhD thesis of G. Chen as well the work with P. Katsikouli and D. Madriaga;  
*Outcomes:* 7 common publications and 1 under-submission paper journal;  
*Involved students:* (PhD) P. O. S. Vaz de Melo, G. Chen, P. Katsikouli; (M.Sc.) D. Madriaga.
4. **Julinda Stefa** (Sapienza Univ. of Rome, Italy, since 2011) (1) on social-based opportunistic data offloading strategies in delay-tolerant challenged networks and (2) on the classification and extraction of personality traits from smartphone crowdsensed datasets;  
*Outcomes:* 2 common publications and 1 under-submission conference paper; The first work was part of the PhD thesis of Marco Valerio Barbera and the second, part of the on-going thesis of Adriano Di Luzio;  
*Involved PhD students:* M. Valerio Barbera and Adriano Di Luzio.
5. **Alessandro Mei** (Sapienza Univ. of Rome, Italy, since 2017) on classification and extraction of personality traits from smartphone crowdsensed datasets. Outcomes constitute part of the PhD thesis of Adriano Di Luzio;  
*Outcomes:* 1 under-submission conference paper;  
*Involved PhD student:* Adriano Di Luzio.
6. **Ana Aguiar** (Univ. of Porto, Portugal, since 2016) on the design of a device-centric decision strategy for future data offloading from mobile crowdsensed datasets of passive WiFi scans. We expect to enhance mobile devices with the capability of locally and efficiently take (i.e., where and when) future offloading decisions to WiFi infrastructure;  
*Outcomes:* 1 common publication;  
*Involved PhD student:* Emanuel Lima.
7. **Antonio F. Loureiro** (Federal Univ. of Minas Gerais – UFMG, Brazil, since 2010) (1) on a proactive data distribution protocol in wireless sensor networks with free-mobile sink nodes, (2) on scenario-adaptive dissemination protocol for Vehicular Networks, (3) on mobile social participatory sensing networks, (4) social attributes extraction in Vehicular Networks, (5) on “what can a mobility trace tell us?”, (6) on deciphering human patterns of motion, (7) on the investigation of exploration patterns on human mobility. The collaboration and outcomes involve(d) several PhD thesis;  
*Outcomes:* 18 common publications; among them the publication in 2019 of a tutorial in a journal of very high impact ACM Computing Surveys (impact factor: 8.82 in 2015). He was also a partner of the EU CHIST-ERA MACACO project and is the Brazilian-side coordinator of the EMBRACE associated team;  
*Involved PhD students:* P. O. M. Vaz de Melo, G. Maia de Menezes, T. da Silva, F. Domingos da Cunha, and J. Batista Borges.
8. **Artur Ziviani** (National Laboratory for Scientific Computing – LNCC, Brazil, since 2008) (1) on an proactive data distribution protocol in wireless sensor networks with free-mobile sink nodes, (2) on adaptive service requirements in wireless self-organizing networks, (3) on forwarding strategies for data offloading through Device-to-Device (D2D) communication, and (4) on the characterization of homophile in call detail records;  
*Outcomes:* 5 common publications; among them the publication of a survey in a journal of very high impact ACM Computing Surveys (impact factor: 15.88 in 2011), 1 tutorial (4h) at the SBRC 2018 conference. He was the Brazilian-side coordinator at STIC AmSud UCOOL project and is a partner of STIC AmSud Motif.  
*Involved students:* (PhD) Rafael L. Costa and (M.Sc.) Haron C. Fanteceli.
9. **Jussara Almeida** (Federal Univ. of Minas Gerais – UFMG, Brazil, since Nov. 2018) on the context-enhanced human predictability in short-term datasets with high spatial resolution. It is a recent started collaboration and involves the PhD student. She is the Brazilian-side coordinator of STIC AmSud MOTIf project;  
*Involved PhD student:* Douglas Teixeira.
10. **Leobino Sampaio** (Federal Univ. of Bahia – UFBA, Brazil, since Jun. 2018) on the design of forwarding strategies leveraging mobility behavior of users, resource capability of devices as well as collaboration interests of users for data offloading through Device-to-Device (D2D) communication;  
*Outcomes:* 1 tutorial (4h lessons, published as a book chapter) at the SBRC 2018 conference;  
*Involved PhD student:* Rafael L. Costa.
11. **Pedro Olmo Vaz de Melo** (Federal Univ. of Minas Gerais – UFMG, Brazil, since Feb. 2018) on the investigation of causalities in habits of human visits. He was also the Brazilian-side coordinator of the EU CHIST-ERA MACACO project and is a member of EMBRACE associated team;  
*Outcomes:* 4 common publications;  
*Involved PhD student:* Lucas Santos.
12. **Kleber Vieira Cardoso** (Federal Univ. of Goiás – UFG, Brazil, since Nov. 2017) on the leveraging of human behavior at the design of user-aware optimization models for resource allocation in 5G wireless networks. He is

partner of the EMBRACE associated team and will spend one sabbatical year in our team from summer 2019;  
*Involved PhD student:* Vinícios Braga.

• **Past collaborations:**

1. **Roy Friedman** (Technion, Israel, 2007-2012), (1) on gossip benefits for wireless self-organizing networks; (2) on data dissemination strategies in wireless sensor networks with mobile sink, (3) on opportunistic forwarding in delay tolerant networks, and (4) on opportunistic storage system for mobile social networks;  
*Outcomes:* 3 common publications (1 top-tier journal ACM SIGOPT OSR);  
*Involved students/post-doc:* (PhD intern) Massimo Vecchio, (Post-Doc) Cigdem Sengul.
2. **Aruna Seneviratne** (NICTA/Univ. of Sidney, Australia, 2011-2016), on content sharing approach in mobile on-line social networks, combining advantages of distributed decentralized storage and opportunistic communications;  
*Outcomes:* 3 top-tier publications (ACM MobiHoc 2013, IEEE TMC 2017, and PMC Elsevier journal 2014); the Best Thesis Award at UNSW in 2015; the development of our work at Yalut application<sup>7</sup>, which got the Best Demo Award at IEEE iToF 2013;  
*Involved PhD student:* Kanchana Thilakarathna.
3. **Mauro Fonseca** (PUC-PR, Brazil, 2012-2018) on user-aware channel allocation in wireless networks. Outcomes involve the PhD thesis of R. Shiguetta. He was partner of the STIC AmSud UCOOL project and is partner of EMBRACE associated team;  
*Outcomes:* 5 common publications;  
*Involved students:* (PhD) Roni Shiguetta and (M.Sc.) P. R. Walenga Junior.
4. **Anelise Munaretto** (Technological and Federal Univ. of Parana – UTFPR, Brazil, 2009-2016), (1) on channel assignment in wireless networks and (2) on prediction-based forwarding protocol for Delay Tolerant Networks. She was partner of the STIC AmSud UCOOL project and is partner of EMBRACE associated team;  
*Outcomes:* 6 common publications and the PhD thesis of A. C. K. Vendramin;  
*Involved students:* (PhD) Ana Cristina K. Vendramin and (M.Sc.) P. R. Walenga Junior.

## 10) Enseignement / Teaching

### Lectures to under-graduate engineering students at Institute Mines-Telecom:

“The culture of the small screen and the born of Tactful Networking ”	3h (Mar. 2017)	Telecom SudParis
“Wireless Mobile Ad Hoc Networks and Opportunistic Networks”	6h (Nov. 2016)	Telecom SudParis
“La carrière de chercheur” and “Smartphone - 6eme sense”	1.5h (May 2016)	Telecom ParisTech

### Lectures and tutorials in schools:

“Human: The new <i>Terra Incognita</i> of networking”	1h30 (Feb. 2019)	GDR RSD and ASF Winter School, Pleyne, France
“Humans in the communication loop: enablers of next generation networks”	4h (May 2018)	Tutorial at SBRC 2018 Campos do Jordão, Brazil
“Mobile data traffic modeling - revealing temporal facets”	3h (Jun. 2017)	EBSIS summer school 2017 <sup>(1)</sup> , Timmendorfer Strand, Germany

(1) School organized in the context of the EBSIS project “Spreading Excellence and Widening Participation” topic in the Horizon 2020 work programme (<http://ebsis.info.uaic.ro>).

<sup>7</sup>[www.yalut.com](http://www.yalut.com)

### Lectures to under-graduate, masters and PhD students at foreign Universities:

"Toward a more tactful networking"	1h (Feb. 2017) 2h (Dec. 2016) 1h (Dec. 2016) 1h (Dec. 2016)	Univ. of Edinburgh, UK Federal Univ. of Goias, Brazil Univ. of Coimbra, Portugal Univ. of Porto, Portugal
(visio) "Mobile context- and content-aware networking" and "MACACO project: objectives and challenges"	1h (Jul. 2015)	Shanghai Jiao Tong Univ., China
"The culture of the small screen and new advances in human behavior"	1h (Apr. 2015)	Univ. Tecnica Federico Santa Maria (USM), Valparaiso, Chile
"The Internet of People and the culture of the small screen: Generating new opportunities for people getting connected"	2h (Nov. 2010)	Federal Univ. of Minas Gerais, Federal State Univ. of Rio de Janeiro, both in Brazil
"Wireless Networking Coding and the Pursuit of Truth"	2h (Nov. 2010)	Pontifical Catholic Univ. of Paraná, Technologic Federal Univ. of Paraná, both in Brazil
"Collaborative Data Collection in Global Sensing Systems"	2h (Nov. 2010)	State Univ. of São Paulo (USP), Brazil

### Seminars:

"Human: The new <i>Terra Incognita</i> of networking"	30min (Oct. 2018)	CoFaBRAs Workshop, Univ. La Rochelle
"Human: The new <i>Terra Incognita</i> of networking"	30min (Nov. 2018)	Workshop on Urban Computing and Society, Petrópolis, Brazil
"Complete trajectory reconstruction from sparse " mobile phone data "	30min (Nov. 2018)	STIC AmSud MOTIF, Petrópolis, Brazil
"Mobile data traffic modeling - revealing temporal facets"	1h (Jun. 2015)	GT Digicosme, Palaiseau
"Measurement-driven mobile data traffic modeling in a large metropolitan area"	1h (Mar. 2015)	Montevideo, Uruguay <sup>(3)</sup>
"Telling apart social and random relationships in dynamic networks"	1h (Sep. 2013)	Workshop related to PAWS European project, Nottingham, UK
"The Internet of people and the culture of the small screen: Generating new opportunities for people getting connected"	1h (Aug. 2010)	Workshop on Internet of Things Shanghai, China

(3) Organized by Daniel Koffman from LINC/S/Telecom ParisTech, the workshop "Information and Communication Systems and their application to vertical sectors" (<http://www.anii.org.uy/workshopuruguay/#objectives>) was targeted to gather together top-level researchers and experts, for (1) Exchanging on visions, recent scientific results and innovative ideas and (2) Triggering further collaboration with colleagues and teams in the Montevideo region.

### Lecturer to Masters-level classes at University of Paris-Sud, France:

"Computer Network (ATM, DiffServ, RSVP, MPLS)"	12h (Nov. 2007)	Univ. of Paris-Sud
"Computer Network (ATM, DiffServ, RSVP, MPLS)"	12h (Nov. 2008 )	Univ. of Paris-Sud

## 11) Diffusion de l'information scientifique / Dissemination of scientific knowledge

### Interviews and articles for the general public:

- *Portrait INRIA (Sep. 2016)*: Interviewed by Charlotte Renaud (Chargée de Communication at INRIA Saclay), after my nomination as "10 Women in Networking / Communications That You Should Watch" (<https://www.inria.fr/centre/saclay/actualites/aline-carneiro-viana-portrait-d-une-chercheuse>).
- *Interview by the Scientific Culture French Interstices magazine (Oct. 2014)*: an audio interview with Joanna Jongwane, designer editor of the magazine and responsible for Interstices podcasts<sup>8</sup>. The review targets an audience that is not especially familiar with computers and/or digital sciences. The interview consisted in asking me questions related to my research work on wireless mobile networks and on the recording of my answers.
- *Parcours de Chercheuse INRIA (Apr. 2014)*: Interviewed by Cathreine Fressoz (Citizen Press) for the 3rd edition of the mathematics week, from 17th to 22nd March 2014 (<https://www.inria.fr/centre/saclay/actualites/aline-carneiro-viana-reseaux-sans-fil-et-sans-frontiere>).
- *Article in general purpose magazine*: "Systèmes répartis de grande taille: de l'anarchie à l'auto-structuration". Réseaux et Télécoms (Lettre Bimestrielle), Editions Techniques de L'Ingénieur (May 2008) [86].

<sup>8</sup>[https://interstices.info/jcms/c\\_34709/podcast-interstices](https://interstices.info/jcms/c_34709/podcast-interstices)

## Talks and panels for the general public:

- *Speaker at "Futur en Seine" festival (June 2014)*: Presentation of the popularized version of the challenges and objectives of the EU MACACO project and a demo of the MACACOApp application to non-specialists at the "Futur en Seine" festival at the CNAM, France. *Title*: "Understanding human behavior for context- and content-aware networking". *Link*: <http://www.futur-en-seine.fr/fens2014/>.
- *Collegians presentation (Mar. 2014)*: Presentations to two highschool classes of Essouriau Collège at Ullis, during the "Semaine des Mathématiques" in France and of the theme "les maths au carrefour des cultures". *Titles*: (1) "Le smartphone, votre 6e sens", consisted in introducing my research activities; and (2) "La carrière et le métier de chercheur" consisted in interacting with students on subjects related to researchers career.
- *Panelist at event of N<sup>2</sup>Women community (Jun. 2013)*: at IEEE SECON 2013. The goal of N<sup>2</sup>Women events is to help female students and researchers pursue research carriers. *Panel topics*: "What are the potential industrial and academic positions for women?"; "How to overcome the job search challenges?"; "How to have a successful transition from graduate school to a full job position?".
- *Speaker at "Unithé ou Café" of INRIA Saclay (October 2013)*: an open 45-minute coffee meeting organized by the Communication Service of INRIA Saclay with all administrative employees and researchers. *Title*: "Le smartphone, votre 6e sens ?" 4 octobre 2013. *Link*: <https://intranet.saclay.inria.fr/vie-du-centre/unithe-cafe/rencontres-2013/smartphone-sens>.

## Keynote:

- 4th GDR RSD and ASF Winter School on Distributed Systems and Networks 2019<sup>9</sup>.
- CoUrb 2018, 2nd Workshop of Urban Computing<sup>10</sup> jointly with SBRC 2018 (the 36th Brazilian Symposium on Computer Networks and Distributed Systems).
- EBSIS summer school 2017, Horizon 2020 work programme<sup>11</sup>.

## Invited speaker at conferences and workshops

- 3rd International Seminar on Contemporary Mobility, among Latin America Universities, 2019.
- TMA Expert Summit at 3rd TMA Conference (Network Traffic Measurement and Analysis Conference) 2019; <sup>12</sup>.
- "CoFaBRAs, Territoires intelligents ou Smart Territories : la révolution numérique au service des territoires", Univ. La Rochelle, France, Oct. 2018.
- "Information and communication systems and their application to vertical sectors" workshop, Montevideo, Uruguay, March 2015 <sup>13</sup>.
- Workshop related to PAWS European project, Nottingham, UK. Sep. 2013.
- GBR "Beyond Networking workshop", Buzios, Rio de Janeiro, Brazil. 2011.
- Int'l Workshop on Internet of Things, Shanghai, China, Aug. 2010.

## Invited lectures in the following Universities/teams:

- Federal Univ. of Goiás (Aug. 2019)  
↔ "When completion challenges current human mobility knowledge";
- Mimove team of Inria Paris (Mai 2019)  
↔ "Human: The new Terra Incognita of Networking";
- National Laboratory for Scientific Computing (LNCC), Brazil (2018)  
↔ "Complete trajectory reconstruction from sparse mobile phone data";
- Univ. of Edinburgh, UK (2017)  
↔ "Toward a more tactful networking";
- Univ. of Porto, Portugal (2016)  
↔ "Toward a more tactful networking";
- Univ. of Coimbra, Portugal (2016)  
↔ "Toward a more tactful networking";
- Univ. of Goias (UFG), Brazil (2016)  
↔ "Toward a more tactful networking";

<sup>9</sup><https://sites.google.com/site/rsdwinterschool/program-2019>

<sup>10</sup><http://www.sbrc2018.ufscar.br/palestra-human-the-new-terra-incognita-of-networking/>

<sup>11</sup><http://ebsis.info.uaic.ro>

<sup>12</sup><https://tma.ifip.org/2019/tma-experts-summit-program/>

<sup>13</sup><http://www.anii.org.uy/workshopuruguay/#objectives>

- Shanghai Jiao Tong University, China (2015)  
↔ *“Mobile context- and content-aware networking” and “MACACO project: objectives and challenges”*;
- Univ. Technica Federico Santa Maria (USM), Valparaiso, Chile  
↔ *“The culture of the small screen and new advances in human behavior”*;
- Complex Network research team of LIP6/UPMC at LIP6 (2012)  
↔ *“Telling apart social and random relationships in wireless networks”*;
- State Univ. of São Paulo (USP), Brazil (2010)  
↔ *“Collaborative Data Collection in Global Sensing Systems”*;
- Federal Univ. of Minas Gerais (UFMG), Brazil (2010)  
↔ *“The Internet of People and the culture of the small screen: Generating new opportunities for people getting connected”*;
- Federal Univ. of the State of Rio de Janeiro (UniRio), Brazil (2010)  
↔ *“The Internet of People and the culture of the small screen: Generating new opportunities for people getting connected”*;
- Pontifical Catholic University of Paraná (PUC-PR), Curitiba, Brazil (2010)  
↔ *“Wireless Networking Coding and the Pursuit of Truth”*;
- Technologic Federal Univ. of Paraná (UTFPR), Curitiba, Brazil (2010)  
↔ *“Wireless Networking Coding and the Pursuit of Truth”*;
- Univ. of Sapienza, Rome, Italy. (2010)  
↔ *“Collaborative Data Collection in Global Sensing Systems”*;
- SWING team of INRIA Lyon, France (2010)  
↔ *“Wireless Networking Coding and the Pursuit of Truth”*;
- TKN laboratory of the TU-Berlin, Germany (2009)  
↔ *“Adaptive network schemes for resource-constrained wireless self-organizing networks”*;
- FOKUS laboratory, Berlin, Germany (2009)  
↔ *“Flexible and adaptive forwarding in resource-constrained wireless self-organizing networks ”*;
- Univ. of Thessaly, Greece (2005)  
↔ *“Locating and routing in large scale self-organizing networks: from distributed hash tables to adaptive addressing structures ”*.



**Formulaire 1 — LISTE COMPLÈTE DES CONTRIBUTIONS<sup>14</sup>****Form 1 — COMPLETE LIST OF CONTRIBUTIONS<sup>14</sup>****1. Publications**

87 international Publications totalising 2084 citations (not include peered reviewed publications in French and Brazilian conferences). H-Index of 25 (according to Google Scholar). A complete publication list with my HDR and Ph.D. dissertations are available at: <http://pages.saclay.inria.fr/aline.viana/publication.html>.

Hereafter, only the journal paper number 25 and the conference papers number 27, 28, and 31 follows the alphabetical order. Otherwise, I have been using the level of implication of the author as protocol to decide on the order of the authors of publications: the Post-Doc/PhD/internship student(s) is usually the 1st author, followed by the collaborators; the advisors and senior co-authors can be ordered according to contribution, on alphabetical order when contributions were similar, or based on seniority (more senior last).

**Summary of peered reviewed publications**

Position	Journals	Conferences	Book Chapters	Workshops	Others
CR1 (since Jan. 2009)	23	31	3	17	15 National conferences
PhD + CR2 (Jan. 2002 - Dec. 2008)	5	4	1	2	4 National conferences
<b>Total (105)</b>	<b>28</b>	<b>35</b>	<b>4</b>	<b>19</b>	<b>19</b>

**1.1 Revues internationales/International journals**

**Note:** the impact factor (1) refers to the year of publication and (2) is the average number of times articles from a journal published in the past two years have been cited in the JCR (Journal Citation Report) year. These results are those generally used and relied upon by technical publications and their stakeholders.

1. T. H. Silva, A. C. Viana, F. Benevenuto, L. Villas, J. Salles, A. Loureiro, and D. Quercia. Urban Computing Leveraging Location-Based Social Network Data: a Survey. To appear at *ACM Computing Surveys*. 2019. (Impact factor: 5.55)
2. G. Chen, A. C. Viana, C. Sarraute, M. Fiore, S. Hoteit. Enriching Sparse Mobility Information in Call Detail Records. *Computer Communications Elsevier journal*. 2018, Volume 122, June 2018, Pages 44-58. (Impact factor: 2.613)
3. E. Mucceli A. C. Viana, K. P. Naveen, and C. Sarraute. Mobile Data Traffic Modeling: Revealing Temporal Facets. *Computer Network Elsevier journal*. Vol 112, Pages 176-193, January 2017. (Impact factor: 2.93)
4. K. Thilakarathna, A. C. Viana, A. Seneviratne, H. Petander. Design and analysis of an efficient friend-to-friend content dissemination system. *IEEE Transaction on Mobile Computing (TMC) journal*, Vol 16(3), pp. 702-715, March 2017. (Impact Factor: 3.74)
5. E. Mucceli A. C. Viana, C. Sarraute, J. Brea, I. Alvarez-Hamelin. On the regularity of human mobility. *Elsevier Pervasive and Mobile computing (PMC) Journal*, Vol. 33, pp. 73-90, December 2016. (Impact Factor: 2.33)
6. A. C. K. Vendramin, A. Munaretto, M. R. Delgado, A. C. Viana, and M. Fonseca. A Social-aware Routing Protocol for Opportunistic Networks. *Elsevier Expert System with Applications*. Vol. 54. Pages 351–363. July 2016. (Impact Factor: 4.68)
7. F. Cunha, L. Villas, A. Boukerche, G. Maia, A. C. Viana, R. A. F. Mini, A. A. F. Loureiro. Data Communication in VANETs: Survey, Applications, and Challenges. *Elsevier Ad Hoc Networks*, 44 (C), Pages 90–103. 2016. (Impact factor: 2.82)
8. M. S. Kuran, A. C. Viana, L. Iannone, D. Kofman, G. Mermoud, and J.-P. Vasseur. "A Smart Parking Lot Management System for Scheduling the Recharging of Electric Vehicles". *IEEE Transaction on Smart Grid Journal*. Vol. 6(6), pp. 2942–2953. Nov. 2015. (Impact factor: 7.88)

<sup>14</sup>Les publications et réalisations les plus significatives devront, dans la mesure du possible, être consultables sur la page web de la candidate ou du candidat.

*Most relevant contributions (publications, software) should, as much as possible, be available for consultation via the web page of the applicant.*

9. P. Olmo V. de Melo, A. C. Viana, M. Fiore, K. Jaffres-Runser, F. Le Mouel, A. A. F. Loureiro, Lavanya Addepallib, and Chen Guangshuo. "RECAST: Telling Apart Social and Random Relationships in Dynamic Networks". *Elsevier Performance Evaluation Journal*. Vol. 87, pp. 19–36, May 2015. (Impact Factor: 1.87)
10. G. Maia, L. A. Villas, A. C. Viana, Andre L. L. Aquino, A. Boukerche, A. A. F. Loureiro. "A Rate Control Video Dissemination Solution for Extremely Dynamic Vehicular Ad hoc Networks". *Elsevier Performance Evaluation Journal*. Vol. 87, pp. 3–18, May 2015. (Impact Factor: 1.87)
11. M. V. Barbera, A. C. Viana, M. D. de Amorim, and J. Stefa. "Data Offloading in social mobile networks through VIP Delegation". *Elsevier Ad Hoc Networks Journal*. Vol. 19. Pages 92–110. August 2014. (Impact factor: 3.36)
12. K. Thilakarathna, A. C. Viana, A. Seneviratne, H. Petander. "User Generated Content Dissemination in Mobile Social Networks through Infrastructure Supported Content Replication". *Elsevier Pervasive and Mobile Computing (PMC) Journal*, Vol. 11. Pages 132-147. April 2014. (Impact Factor: 3.38)
13. M. H. Rehmani, A. C. Viana, H. Khalife, and S. Fdida. "SURF: A Distributed Channel Selection Strategy for Data Dissemination in Multi-Hop Cognitive Radio Networks". *Elsevier Computer Communications Journal*, Vol. 31. Issues 10-11. June 2013. (Impact factor: 2.78)
14. G. Maia, Daniel L. Guidoni, Aline C. Viana, Andre L. L. Aquino, Raquel A. F. Mini, Antonio A. F. Loureiro. "A Distributed Data Storage Protocol for Heterogeneous Wireless Sensor Networks with Mobile Sinks". *Elsevier Ad Hoc Networks Journal*, Vol. 1, Issue 5, July 2013. (Impact factor: 3.54)
15. N. Karowski, A. Carneiro Viana, and Adam Wolisz, "Optimized Asynchronous Multi-channel Discovery of IEEE 802.15.4-based Wireless Personal Area Networks". *IEEE Transaction on Mobile Computing*, Vol. 12, Issue 10. October 2013. (Impact Factor: 5.67)
16. A. Carneiro Viana and M. D. De Amorim, "Coverage Strategy for Periodic Readings in Robotic-Assisted Monitoring Systems Ad Hoc Networks". *Elsevier Ad Hoc Networks journal*. Vol. 11, Issue 7. September 2013. (Impact factor: 3.54)
17. A. C. K. Vendramin, A. Munaretto, M. R. Delgado, and A. C. Viana, "Grant: Inferring best forwarders from complex networks' dynamics through a greedy ant colony optimization", *Elsevier Computer Networks*, special issue "Complex Dynamic Networks: Tools and Methods". Volume 56, Issue 3, pp. 997 –1015, February 2012. (Impact factor: 3.28)
18. F. Le Fessant, A. Papadimitriou, A. C. Viana, C. Sengul, and E. Palomar. "A Sinkhole Resilient Protocol for Wireless Sensor Networks: Performance and Security Analysis". *Elsevier Computer Communications journal*, 35, issue 2 pages 234–248. January 2012. (Impact factor: 2.47)
19. C. Sengul, A. C. Viana, and A. Ziviani. "A Survey of Adaptive Services to Cope with Dynamics in Wireless Self-Organizing Networks". *ACM Computing Surveys*, vol 44, Issue 4, August 2012. (Impact factor: 15.88)
20. P. R. Walenga Junior, M. Fonseca, A. Munaretto, A. C. Viana, and A. Ziviani. "ZAP: A Distributed Channel Assignment Algorithm for Cognitive Radio Networks". Special Issue on Multiple Access Communications in Future-Generation Wireless Networks. *Springer Eurasip Journal on Wireless Communications and Networking*, vol. 2011, article number 27. July 2011. (Impact factor: 1.98)
21. A. C. Viana, S. Maag, F. Zaidi. "One step forward: Linking Wireless Self-Organizing Networks Validation Techniques with Formal Testing approaches". *ACM Computing Surveys*. Vol. 43, issue 2. June 2011. (Impact factor: 18.08)
22. M. Vecchio, A. C. Viana, A. Ziviani, R. Firedman. "Deep: Density-based Proactive Data Dissemination Protocol for Wireless Sensor Networks with Uncontrolled Sink Mobility". *Elsevier Computer Communications*. Vo. 33, issue 8, pages 929-939. May 2010. (Impact factor: 2.53)
23. A. C. Viana, A. Ziviani, R. Friedman. "Decoupling Data Dissemination from Mobile Sink's Trajectory in Wireless Sensor Networks". *IEEE Communications Letters*. Vol. 13, issue 3. March 2009. (Impact factor: 2.20)
24. J. Rahme, A. C. Viana, K. Al Agha. "Looking for network functionalities' extension by avoiding energy-compromised hotspots in wireless sensor networks". *Springer Annals of Telecommunications* (Special Issue on Home Networking). Vol. 63, Number 9-10, pages 487-500 . October 2008 (Impact factor: 0.45)
25. R. Friedman, D. Gavidia, L. Rodrigues, A. C. Viana, and S. Voulgaris. "Gossiping on MANETs: the Beauty and the Beast". *ACM SIGOPT Operating Systems Review (ACM SIGOPT OSR)* - v.41, no 4, October 2007. (Impact factor: 4.63)

26. A. C. Viana, Marcelo D. de Amorim, Yannis Viniotis, Serge Fdida, JosÃ© F. de Rezende. Twins: A Dual Addressing Space Representation for Self-organizing Networks. *IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS)* - v.17, no 12, pages 1468-1481. December 2006. (Impact factor: 3.51)
27. A. C. Viana, Marcelo D. Amorim, Serge Fdida, JosÃ© F. de Rezende. "Self-organization in spontaneous networks: the approach of DHT-based routing protocols". *Elsevier Ad Hoc Networks Journal*, 3 (5). September 2005. (Impact factor: 8.03)
28. A. C. Viana, Marcelo D. Amorim, Serge Fdida, JosÃ© F. de Rezende. "An Underlay Strategy for Indirect Routing", *ACM/Springer Wireless Networks*, 10(6), November 2004 (Impact factor: 10.38)

## 1.2 Conférence internationales avec comité de lecture/Reviewed international conferences

1. P. Katsikouli, A. C. Viana, M. Fiore, A. Tarable. On the Sampling Frequency of Human Mobility. IEEE GLOBECOM. Singapore, December 2017. (Acceptance ratio: 32%)
2. G. Chen, A. C. Viana, M. Fiore, C. Sarraute. The Spatiotemporal Interplay of Regularity and Randomness in Cellular Data Traffic. IEEE LNC. Singapore. October 2017.
3. R. Shiguetta, M. Fonseca, Aline C. Viana. A Mobility-Aware Channel Allocation Strategy for Clustered Ad hoc Network. IEEE VTC-Spring. Sydney, Australia, June 2017.
4. R. Shiguetta, M. Fonseca, Aline C. Viana. User Behavior-Aware Channel Allocation Scheme for Mobile Ad hoc Networks. IEEE IPCCC, Las Vegas. USA. December 2016. (Acceptance ratio: 27.5%)
5. D. P. Paramo, L. Iannone, D. Kofman, and A. C. Viana. Adaptation of Topology-Based Routing Protocols for Data Gathering Applications in VANETs. IEEE Vehicular Networking Conference (VNC). Kyoto. Japan, Dec. 2015.
6. E. Mucceli A. C. Viana, K. P. Naveen, and C. Sarraute. "Measurement-driven mobile data traffic modeling in a large metropolitan area". IEEE Percom. Missouri. March, 2015. (Acceptance ratio: 15%)
7. R. Shiguetta, M. Fonseca, Aline C. Viana. A Strategy for Opportunistic Cognitive Channel Allocation in Wireless Internet of Things. IFIP Wireless Days, Rio de Janeiro, Brazil. November 2014.
8. T. H. Silva, P. O. S. Vaz de Melo, J. M. Almeida, A. C. Viana, J. Salles, and A. A. F. Loureiro. "Participatory Sensor Networks as Sensing Layers". IEEE International Conference on Social Computing and Networking (SocialCom2014). Sydney, Australia. December 2014.
9. F. Cunha, A. C. Viana, R. A. F. Mini, A. A. F. Loureiro. "Socially inspired data dissemination for vehicular ad hoc networks". ACM MSWiM, Montreal, Canada. September 2014. (Acceptance ratio: 24.6%)
10. E. Mucceli and A. C. Viana. "From routine to network deployment for data offloading in metropolitan areas". IEEE SECON. Singapore. June. 2014. (Acceptance ratio: 19%)
11. F. Cunha, A. C. Viana, R. A. F. Mini, A. A. F. Loureiro. "Is it possible to find social properties in vehicular networks?" IEEE ISCC. Madeira, Portugal. June 2014.
12. E. Mucceli and A. C. Viana. "From routing to better network services" (short paper). IFIP WMNC. Vilamoura, Portugal. May 2014. (Acceptance ratio: 32.9%)
13. E. Mucceli and A. C. Viana. "Routine-based network deployment for data offloading in metropolitan areas". IEEE WCNC. Istanbul, Turkey. April. 2014. (Acceptance ratio: 42.3%)
14. T. H. Silva, P. O. S. Vaz de Melo, A. C. Viana, J. M. Almeida, J. Salles, and A. A. F. Loureiro. "Traffic condition is more than colored lines on a map: Characterization of Waze alerts". SocInfo 2013. Kyoto, Japan. November 2013.
15. P. Olmo V. de Melo, A. C. Viana, M. Fiore, K. Jaffres-Runser, F. Le Mouel, A. A. F. Loureiro. "RECAST: Telling Apart Social and Random Relationships in Dynamic Networks". ACM MSWiM, Barcelona, Spain, November 2013. (Acceptance ratio: 25.9%)
16. G. Maia, C. Rezende, L. A. Villas, D. L. Guidoni, A. Boukerche, A. C. Viana, Andre L. L. Aquino, A. A. F. Loureiro. Traffic "Aware Video Dissemination Over Vehicular Ad hoc Networks". ACM MSWiM, Barcelona, Spain, November 2013. (Acceptance ratio: 25.9%)
17. K Thilakarathna, A. C. Viana, A. Seneviratne, H. Petander. "Mobile Social Networking through Friend-to-Friend Opportunistic Content Dissemination", ACM Mobihoc. Bangalore, India. August 2013. (Acceptance ratio: 15%)
18. G. Maia, L. A. Villasy, A. Boukerche, A. C. Viana, A. L. L. Aquino, and A. A. F. Loureiro. "Data Dissemination in Urban Vehicular Ad Hoc Networks with Diverse Traffic Conditions". IEEE ISCC. Split, Croatia, July 2013. (Acceptance ratio: 48.7 %)
19. G. Maia, A. Boukerche, A. L. L. Aquino, A. C. Viana, and A. A. F. Loureiro. "A Data Dissemination Protocol for Urban Vehicular Ad hoc Networks with Extreme Traffic Conditions". IEEE ICC - Wireless Networking Symposium. June 2013. (Acceptance ratio: 39.1 %)
20. A. C. K. Vendramin, A. Munaretto, M. R. Delgado, and A. C. Viana, "CGrAnt: a Swarm Intelligence-based Routing Protocol for Delay Tolerant Networks". ACM GECCO. Philadelphia. USA. July 2012. (Acceptance ratio: 37%)

21. M. H. Rehmani, A. C. Viana, H. Khalife, and S. Fdida. "Activity Pattern Impact of Primary Radio Nodes on Channel Selection Strategies". 4th International Conference on Cognitive Radio and Advanced Spectrum Management (CogART). Paris, France. September 2011. (Invited Paper)
22. M. H. Rehmani, a. C. Viana, H. Khalife, and S. Fdida. "Improving Data Dissemination in Multi-Hop Cognitive Radio Ad-Hoc Networks". AdHocNets. Paris, France. September 2011 (Invited Paper).
23. G. Bigwood. A. C. Viana, M. Boc, M. D. de Amorim, "Collaborative Data Collection in Global Sensing Systems". IEEE LCN. Bonn, Germany, October 2011. (Acceptance ratio: 29.3%)
24. M. V. Barbera, J. Stefa, A. C. Viana, M. D. de Amorim, and M. Boc. "VIP Delegation: Enabling VIPs to Offload Data in Wireless Social Mobile Networks". IEEE DCOSS. Barcelona, Spain. June 2011.
25. N. Karowski, A. C. Viana, A. Wolisz. "Optimized Asynchronous Multi-channel Neighbor Discovery". IEEE Infocom 2011. Shanghai, China. May 2011. (Acceptance ratio: 16%)
26. M. Rehmini, A. C. Viana, H. Khalife. "A Cognitive Radio Based Internet Access Framework for Disaster Response Network Deployment". 4th International Conference on Cognitive Radio and Advanced Spectrum Management (CogART). Rome, Italy, November 2010. (Invited Paper)
27. A. C. Viana, N. Mitton, L. Schmidt, and M. Vecchio. "A k-layer self-organizing structure for product management in stock-based networks". IEEE International Conference on e-Business Engineering (ICBE), Shanghai, Chine, November 2010.
28. A. C. Viana, T. Herault, T. Largillier, S. Peyronnet, and F. Zaidi. "Supple: a flexible probabilistic data dissemination protocol for wireless sensor networks". ACM MSWiM, Bodrum, Turkey, October 2010. (Acceptance ratio: 32.6%)
29. T. Razafindralambo, N. Mitton, Aline C. Viana, M. D. de Amorim, and K. Obraczka, "Adaptive Deployment for Pervasive Data Gathering in Connectivity-Challenged Environments", IEEE Percom, Mannheim, Germany, April 2010. (Acceptance ratio: 11.5%)
30. G. Karbaschi, A. C. Viana, S. Martin, and K. Al Agha. "On using network coding in multi-hop wireless networks". IEEE PIMRC. September 2009. (Acceptance ratio: 44.2%)
31. A.-M. Kermarrec, A. Mustefaoui, M. Raynal, G. Tredan, A. C. Viana, "Large-scale networked systems: from anarchy to geometric self-structuring". ICDCN. Gachibowli Hyderabad, India. Januray 2009. (Acceptance ratio: 13.6%)
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2. E. Lima, A. Aguiar, A. C. Viana and P. Carvalho. Impacts of Human Mobility in Data Offloading. ACM CHANTS, jointly with ACM MobiCom. New Delhi, India. October 2018.
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20. E. Le Merrer, V. Gramoli, A. C. Viana, M. Bertier, A.-M. Kermarrec. "Energy Aware Self-organizing Density Management in Wireless Sensor Networks", 1st International Workshop on Decentralized Resource Sharing in Mobile Computing and Networking (ACM MobiShare) with ACM Mobicom, Los Angeles, CA. September 2006.

I have also co-authored the following:

- **Pending patent:** together with M. Fiore and P. Katsikouli we started at Inria the procedure to register the patent named "Mobility Adaptive Location Sampling System for Mobile Devices";
- a Brief Announcement at PODC: G. Tredan, A. C. Viana, A.-M. Kermarrec, M. Raynal, A. Mustefaoui, "From anarchy to geometric structuring: the power of virtual coordinates". ACM PODC (BA). Toronto, Canada. August 2008;
- **8 papers in French conferences (with peering review)** of my domain, such as Algotel (Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications), CoRES (Rencontres Francophones sur la Conception de Protocoles, l'Évaluation de Performance et l'Expérimentation des Réseaux de Communication), or CFIP (Colloque Francophone sur l'Ingénierie des Protocoles);

- **11 papers in the SBRC Brazilian conference (with peering review)**, the biggest and most important Brazilian conference in networking (average acceptance ratio is of 33%). Each year it provides talks of very known keynotes from all around the world, such as: Vint Cerf (Google), Jon Crowcroft (UCL), Vijay K. Bhargava (Univ. of British Columbia), Raouf Boutaba (University of Waterloo), Christophe Diot (Technicolor), Scott Shenker (Univ. of California, Berkeley), Schahram Dustdar (TU Wien, Austria);
- **27 research/technical reports in Hal Inria**, some currently under submission to journal or conferences.

## 2. Développements technologiques : logiciel ou autre réalisation / *Technology development : software or other realization*

### 1. AdaptiveSamplingApp and FixedSamplingApp Android application (2018-)

**Software characterization:** A-1; SO-4; SM-2; EM-2; SDL-1

**Own contribution:** DA-4, CD-1, MS-2, TPM-4

**Implication:** 30%. **People involved:** D. Madriaga, P. Katsikouli, and M. Fiore

**Lines of code:** 4412

**Description:** Two mobile phone Android applications for the sampling of phone's information on positioning (through, e.g., GPS and WiFi/Cellular environment): the FixedSamplingApp application periodically (i.e., in constant intervals) samples such information, analysed in details in [33]; the AdaptiveSamplingApp application samples such information in a way that is adapted to the speed of movement of users. The goal of designing these two applications in parallel is to test the benefits of the adaptive sampling approach in terms of battery and memory of phones when compared to a constant sampling. Once anonymized, the information collected is time-stamped, and periodically sent to the central servers for analysis and visualization. We have recruited volunteers of our team (i.e., a group of 8 people among students and collaborators). Collected data is available only for people involved on this deployment and only for research purposes and approach testing.

**Users' community:** Users mobility is leveraged by a number of services and applications (about 24% of Android application are built on top of mobility information): Waze, uber, blablacar, on-line games, smart health applications, content providers (NetFlix, google, facebook, twitter, flicker, etc), smart city applications (sport or cultural events, transportation systems, personalised touristic visits, safety applications).

**Patent:** We started with Inria the procedure for the registration of the patent named "Mobility Adaptive Location Sampling System for Mobile Devices".

**Impact:** Mobility-aware services and applications use a constant sampling that consumes a lot of battery. Our adaptive sampling approach will provide a more energy efficient way for mobility-aware services and applications execution, while collecting less mobility information from users [33]. A **patent** procedure has started at Inria.

### 2. Context-enhanced Trajectory Reconstruction (CTR) (2017-2018)

**Software characterization:** A-3; SO-4; SM-2; EM-2; SDL-2

**Own contribution:** DA-3, CD-1, MS-1, TPM-4

**Implication:** 30%.

**Website:** <https://gitlab.inria.fr/guchen/trajectory-reconstruction-tool>

**People involved:** G. Chen and M. Fiore

**Lines of code:** 8000

**Description:** This is the implementation of the strategy named Context-enhanced Trajectory Reconstruction, a new technique to fully complete individual CDR-based trajectories that hinges on tensor factorization as a core method, presented in [15]. The strategy is designed to be applied in Call Detail Records (CDRs) datasets. CDRs are logs of events (such as voice calls, text messages) generated during mobile communications. This completion strategy is to be applied in CDR having at least the following fields: userID, event time, and Cell Tower identifier/coordinates.

**Users' community:** Anyone interested in completing CDR datasets before their use for own purposes. Students from UFMG/Brazil are already using it.

**Impact/Publication:** [15], This work revealed (1) the importance of the spatio-temporal quality of the data sources and (2) the limitations of the use of incomplete CDRs in seminal literature mobility modeling works. Hence, it brought back very interesting research questions until now considered as settled. The CTR is the first technique existent to complete sparse CDR datasets. It is used by D. Teixeira in his work thesis.

### 3. MACACOApp Android application (2014-2016)

**Software characterization:** A-4; SO-3; SM-3; EM-3; SDL-4

**Own contribution:** DA-3, CD-1, MS-2, TPM-4

**Implication:** 15% **Website:** <https://macaco.inria.fr/macacoapp/>

**People involved:** T. Peng, K. Jaffres-Runser, K. Garg, A. Ferrari

**Lines of code:** 7630

**Description:** Mobile phone Android application that periodically samples phone's information on the mobility (through, e.g., GPS sensor, accelerometer and WiFi/Bluetooth/Cellular environment, connectivity type) and on the data traffic

it generates (through, e.g., Internet browser history and applications data consumption). Once anonymized, the information collected is time-stamped, and periodically sent to the central servers for analysis and visualization. Users are also invited to fill a non-mandatory questionnaire relevant to this study. Our questionnaire collects information about the personality traits (Big5 model) and application preferences of people. User's application preferences and interests are inferred from the Internet browsing history and running app information obtained from the MACACO App.

**Users' community:** recruited volunteers of EU CHIST-ERA MACACO project have installed the app. Collected data is available only for EU CHIST-ERA MACACO partners, for research purposes.

**Impact:** Thanks to such application, we could collect very rich data from smartphones of volunteers (55 users) that was used at the following works: [4, 8, 9, 11, 25, 33]. Besides, MACACO dataset is being used in the thesis of: R. Lima Costa, L. Amichi, J. Batista Borges, and D. Teixeira.

4. MDTGen Simulator (2014-2015)

**Software characterization:** A-5; SO-4; SM-3; EM-4; SDL-1

**Own contribution:** DA-4, CD-2, MS-1, TPM-4

**Implication:** 30%

**Website:** <http://macaco.inria.fr/software/>

**People involved:** E. Muccelli R. Oliveira, K. P. Naveenb, Carlos Sarraute

**Lines of code:** 500

**Description:** This is a Synthetic Mobile Data Traffic Generator (MDTGen) presented in [57], capable of simulating traffic-related activity patterns for different categories of subscribers and time periods for a typical day in their lives. The generator was designed from real data from more than 6.8 million subscribers in Mexico City. We have first characterized individual subscribers' routinary behavior (i.e., "when" and "how much" traffic is generated). We have then classified the subscribers into six distinct profiles according to their usage patterns and modelled these profiles according to two daily time periods: peak and non-peak hours. Our generator takes then this profile modeling into account at the generation of data traffic for each synthetic subscriber per time period.

**Users' community:** The general community interested in testing solutions requiring the simulation of real mobile cellular data traffic of a large population.

**Impact/Publications:** [56, 57]; First synthetic mobile traffic generator leveraging regularity of data traffic of users. It is used in the thesis of V. Braga.

5. Yalut Android application (2013-2014)

**Software characterization:** A-5; SO-3; SM-3; EM-2; SDL-4

**Own contribution:** DA-3, CD-1, MS-1, TPM-2

**Implication:** 15%

**Website:** <http://www.yalut.com>

**People involved:** K. Thilakarathna, X. Guan, A. Seneviratne

**Lines of code:** 1809

**Description:** This application implements the content delivery system presented in our [84, 82, 85] papers. Yalut implements a distributed content sharing as an overlay service for popular centralized social networking services. Available for Android Smartphones, Mac and Windows desktop at the Google Play Store and at Yalut webpage. Presented in the demo session of ACM SIGMOBILE MobiSys 2014 [27] and got the Best Demo Award at IEEE iToF 2013 Demo and Poster Competition [81].

**Users' community:** The general public. Any application distribution and support is managed by NICTA.

6. Enhancement of Cognitive Radio Cognitive Network (CRCN) patch of NS-2 simulator (2010-2011)

**Software characterization:** A-5; SO-3; SM-2; EM-2; SDL-5

**Own contribution:** DA-2, CD-1, MS-1, TPM-2

**Implication:** 5%

**People involved:** M. H. Rehmani

**Lines of code:** 5000

**Description:** Enhancement of the Cognitive Radio Cognitive Network (CRCN) patch of NS-2 by adding a PR activity block to model activity of the primary radio (PR) nodes that support cognitive radio functionalities in NS-2, using C++. The CR mac layer was also modified to provide the capability to the CR network layer to make the channel selection decision. As the main advisor of the PhD student, who developed this software (M. H. Rehmani), I advised him on the PR activity design and supervising results. Details on the CRCN modifications can be found in appendix B of his PhD Thesis: <https://tel.archives-ouvertes.fr/tel-00630214>.

**Users' community:** Cognitive Radio Network research community (i.e. users of NS-2 working on CRCN).

**Impact/Publication:** [72]; Incorporated at the network simulator version 2.0, so used by users who are interested in simulating Cognitive Radio Networks.

7. Implementation of the Random Walk-based simulator (2009)

**Software characterization:** A-1; SO-3; SM-1; EM-1; SDL-1

**Own contribution:** DA-4, CD-4, MS-4, TPM-4

**Implication:** 100%

**People involved:** A. Ziviani, R. Friedman

**Description:** Design and C implementation of a simple wireless sensor network simulator to validate our Random Walk-based approach presented in [98] and compare it with related work approaches. Implemented modules were: topology creation, message forwarding, and probabilistic packet collision. I performed the full design, coding, debugging, maintenance of the simulator as well as generated/plotted results.

**Users' community:** Own use of my research.

**Impact/Publication:** [98], used only by myself to generate results for this publication.

8. Implementation of the Hilbert-based trajectory design simulator (2008)

**Software characterization:** A-1; SO-3; SM-1; EM-1; SDL-1

**Own contribution:** DA-3, CD-4, MS-4, TPM-4

**People involved:** M. D. de Amorim

**Description:** Design a C implementation of a simple wireless simulator to validate our Hilbert-based trajectory design approach [5, 95] and compare it with related work approaches. Implemented modules were: topology creation, Hilbert curve design, message forwarding, probabilistic packet collision. I performed the full design, coding, debugging, and maintenance of the simulator as well as generated/plotted results.

**Users' community:** Own use of my research.

**Impact/Publications:** [5, 95], used only by myself to generate results for this publication.



## Formulaire 2 — DESCRIPTION SYNTHÉTIQUE DE L'ACTIVITÉ ANTÉRIEURE

### Form 2 — SUMMARY OF YOUR PAST ACTIVITY

My interests are in computer networks with emphasis on domains related to *mobile wireless networking, human behavior modeling, Internet of Everything (IoE), and smart cities*. My past activities can be structured around two main topics: (i) the *design of adaptive services and communication protocols* for wireless self-organizing networks (WSONs) and (ii) the *characterization and leveraging of human behavior* affecting resources or service usage in mobile internet edge networks. My research methodology favors the confrontation of proposed methods with real-world observations. Whenever appropriate, I apply techniques and tools from multiple areas, such as information theory, statistics, and machine learning.

The primary goal of my research activities related to WSONs was to provide network-level support for successful data delivery. The central question driving my activities was: “*what are the networking services underlying the design of successful communication strategies in wireless self-organizing networking systems?*” To answer this question, the strategy was to introduce adaptation functionality to particular tasks performed by nodes (e.g., resource management) or inside the network (e.g., topology management) [75, 97, 99]. Then, following the new communication opportunities and the dynamic shift observed over the years in wireless networks, my research activities gradually shifted to data dissemination and adaptive forwarding in intermittently connected and opportunistic networks.

After 12 years working on WSONs and motivated by the impact brought by pervasive smart devices on our lives, I perceived the importance of better understanding the impact of user behaviors on network design and operation. To manage the complexity of the smart urban environments of tomorrow, I advocate such understanding has to become a intrinsic part of networking system/protocol/service design. Hence, my research activities since 2014 are centered on the deep understanding of the underlying mechanism and features explaining human behaviors, as well as on solutions leveraging the outcomes of such understanding.

#### ADAPTIVE SERVICES AND PROTOCOLS FOR WIRELESS SELF-ORGANIZING NETWORKS (2006-2014)

Wireless self-organizing networks have intrinsic characteristics (e.g., mobility, resource limitation, unreliable wireless communication) that require specific solutions and set them apart from traditional networks. The different types of WSONs (e.g., wireless sensor networks, vehicular ad hoc networks) require distributed and adaptive networking functionalities to deal with their dynamic nature and to find a fit between their operation and the environment. Hereafter, I summarize my efforts to tackle such requirements.

**Topology management** aims at shaping the network topology to achieve a certain objective, such as better connectivity, fault-tolerance, or energy management. In this context, our strategies modify the network topology:

- **Through node adaptation (1)** for network lifetime extension: *Contrarily to literature*, we have reduced nodes activity [52] (i.e., adjusting nodes duty cycle), while exploiting the absence of traffic in the active sensing state of devices; **(2)** for particular rule assignment to nodes: *Contrarily to related works*, we do not rely on any anchors, position-aware landmarks, or signal measurements [35, 36], and still generate lower communication overhead and require less computation power than related works;
- **Through controlled mobility** by taking advantage of the mobility of devices, our solutions guarantee the coverage of the target area while limiting the number of sensors in the monitored region (near the optimum). The originality of our proposal is that it *bounds the delivery delays of readings and monitoring overhead*, contrarily to other solutions in the literature [5, 67, 95].

**Data management** concerns *collection strategies* to correctly send data to central entities and *dissemination strategies* determining how data is propagated to destinations. The works here were very well acknowledged by the wireless networking community, as attested by the publications.

- Our solutions on **data collection** [48, 90, 96, 98] were *the first in the literature* to solve the problem of efficient data gathering in wireless sensor networks with mobile sinks performing free trajectory. We designed four different systems that had a significant impact on the field. **Fiche 4** details such contributions.
- Our **dissemination strategies** investigate **(1)** dissemination of report events to drivers inside a region of interest in highways [49] or urban [43, 45] Vehicular Networks (VANETs). While related works solely focus on dense and connected scenarios, our dissemination solutions *seamlessly adapt to the road traffic conditions, operating in both connected and intermittently connected VANETs*. **Awards:** [44] was one of the top-rated papers in *A-ranked ACM MSWIM 2013* recommended to be published at a special issue of PEVA Elsevier journal [51]. **(2)** a community-based

greedy heuristic algorithm with novel dynamic centrality metrics (i) to well select a limited number of devices to carry the content and (ii) to leverage such selected devices to propagate the content to others via opportunistic communication [2, 3, 82, 84, 85]. Contrarily to the related literature, the fundamental challenge we tackled was to *minimize the number of replicas while ensuring high and timely availability* [82]. **Awards:** There was an implementation of the proposal in the Yalut cloud service smartphone application, which received a Best Demo Award [27]. The Ph.D. student involved in this work received the Best Thesis Award (“Malcolm Chaikin Prize” at UNSW, Australia, 2015).

**Adaptive forwarding** dictates the quality of the selected route in routing protocols. Our protocols brought solutions to the challenge of matching forwarding decisions on-the-fly to different network dynamics (sparsity, node mobility, or disconnections), while respecting resource constraints. We designed thus Seeker [73, 74] and GrAnt [37, 91, 92, 93] protocols. Both protocols provide mechanisms to gather from network dynamics, information describing how promising nodes are as relays. While Seeker is based on *probabilistic forwarding decisions*, GrAnt suggests the use of *deterministic decision rules*. When compared to existing works in the literature, we show that our protocols can *adapt their forwarding accordingly in various connectivity scenarios* and achieve higher performance with lower overhead, while respecting buffer constraints. GrAnt was published at the *A-ranked ACM GECCO 2012* [92].

## **CHARACTERIZATION AND LEVERAGING HUMAN BEHAVIOR (since 2014)**

More recently, I have been interested in studying the way people connect to, interact with, or impact mobile internet edge networks. I believe the understanding of *human behavior and their network interactions* have to become part integrant of networking solutions’ design. My main goals here are (1) to improve network perception on social norms/structure shaping the behavior of individuals within the network and (2) to accordingly provide the required support for smarter and human-aware decision-making in protocol/architecture/service design. My current contributions rely on the *characterization and modeling of human behaviors* (i.e., mobility, interactions or content demand) as well as on the leveraging of patterns of behaviors in *data offloading or trajectory reconstruction solutions*. Finally, the activities described hereafter gave me the first hints and motivations of my **Research Program of Form 4**.

**Human behavior understanding:** It concerns my investigations on (1) *human mobility patterns*, i.e., the analysis of properties and laws governing human motion; (2) *human wireless interactions*, i.e., the classification of types of human encounters according to their frequency and neighborhood overlapping; and (3) *per-individual content demand*, i.e., profiling of content demand of cellular network users as well as spatiotemporal prediction of traffic volume. **In (1)**, we were *the first to attest* relevant human motion properties (revealed in literature works) when using fine-grained datasets [53, 59, 54, 58]. **In (2)**, we investigated wireless encounters of users according to encounters’ regularity, similarity [61, 89], and centrality [1, 3, 87, 82, 84, 85]. **In (3)**, we were *the 1st to investigate and model* the per-user repetitive behavior (i.e., daily routines) in data consumption patterns [56, 57], which resulted at the design of a synthetic mobile traffic generator. The outcomes of such works were leveraged at the design of strategies for: data offloading, hotspot deployment, or trajectory reconstruction of coarse-grained datasets. **Fiche 1** details such contributions.

**Data offloading solutions:** where we exploit (1) *infrastructure deployment* or (2) *direct device-to-device opportunistic communication* as solutions to deal with the boost up of data consumption that is straining cellular network. Such solutions leveraged outcomes of our investigations on human behaviors. **In (1)**, we tackle the deployment problem of hotspots in a metropolitan area, aiming to shift the traffic of cellular networks to WiFi networks [54]. **In (2)**, we exploit, whenever possible, the opportunistic communication between a few, important network devices to offload traffic from the cellular network [1, 3, 87]. **Fiche 2** details such contributions.

**Trajectory reconstruction:** Call Detail Records (CDR datasets collected by telecom operators) are an important source of information for large-scale mobility studies. CDRs are often characterized by spatial and temporal sparsity, which, in turn, can bias mobility analyses based on such data. We were the *first in the literature* (1) *to investigate how* such sparsity affects the accuracy and incompleteness of mobility information; (2) *to assess the impact* of such spatiotemporal sparsity in identifying important locations, in measuring individual movements, or in seminal literature studies analyzing human mobility properties; (3) *to propose novel and effective techniques* to reduce temporal sparsity in CDR by leveraging regularity in human movement patterns [15, 16, 25, 26]. There is *no equivalent work in the literature*. Ph.D. students already use our strategies at the University of Porto (Portugal) and UFMG (Brazil). **Fiche 3** details such contributions.

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