DETAILED CURRICULUM VITAE

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1.Degrees

Doctorat(s) :
– PhD in Computer Engineering, University of Southern California, Los Angeles, California, USA, July 2008, (graduated first class)
Autres diplômes (à partir du niveau Master) :
– Master of Science (MS) in Electrical Engineering, University of Southern California, Los Angeles, California, USA, December 2005 (graduated first class with the maximum possible grade of 4.0/4.0)

2. Career

Current professional status : Inria CR2 depuis le 01/09/2009
Centre de recherche Inria : Paris-Rocquencourt
Équipe-projet Inria : ARLES

Institution français ou étrangers	Function and status (salarié, boursier, etc.)	Dates d'entrée en fonction	Dates de cessation de fonction	Observations
INRIA Paris Rocquencourt	*Chargé de Recherche, première classe*	Sept. 2009	-	
INRIA Paris Rocquencourt	Postdoctoral Fellow	July 2008	Aug. 2009	Inria postdoctoral fellowship
University of Southern California, USA	Graduate Assistant during PhD	July 2003	July 2008	Graduated First Class
University of Southern California, USA	Graduate Assistant during MS	July 2003	Dec. 2005	Graduated First Class, 4.0/4.0

3. Prizes and Distinctions

Academic/Research Scholarships
– IEEE TCPP Travel Grant for PhD Forum at IEEE International Parallel and Distributed Computing Symposium (IPDPS 2008)
– Teaching Assistantship at University of Southern California, 2003 - 2005
– Research Assistantship at University of Southern California, 2005 - 2008
– Awarded the Intel Travel Scholarship to attend the International Conference on High Performance Computing HiPC 2001 in Hyderabad and HiPC 2002 in Bangalore, India
– Awarded Scholarships from the Govt. of India for scoring among the top 0.1% students in Mathematics and Physics in India in the AISSCE exams of 1999

Teaching Awards
– Honorable Mention as a Teaching Assistant, EE-Systems, USC, 2006
– Best Teaching Assistant Award, Department of EE-Systems, USC, 2005

Academic Performance Awards

- President Shankar Dayal Sharma Award for Outstanding Overall Achievement, Banaras Hindu University, Varanasi, India, 2003
- Outstanding Student of the Institute Award, Indian Institute of Technology (Banaras Hindu University) Varanasi, 2003
- Late Shyam Sunder Lal Razdan Memorial Gold Medal for securing highest percentage of marks in B.Tech. Part-IV Examination, Indian Institute of Technology (Banaras Hindu University), Varanasi, 2003
- Institute Gold Medal for securing highest grades, Indian Institute of Technology (Banaras Hindu University), Varanasi, 2000, 2001, 2002, 2003
- Secured a rank of 815 in IIT-JEE 1999 (National engineering entrance exams in India for entry into the IITs ; approx. 200,000 examinees)
- Selected for the International Chemistry Olympiad Training Camp after having cleared the Indian National Chemistry Olympiad conducted by Govt. of India in 1999 (One of 35 students from all over India)
- Cleared the Regional Mathematic Olympiad and was selected for the Indian National Mathematics Olympiad conducted by Govt. of India in 1998
- Selected for the prestigious National Talent Search Scholarship by the Govt. of India in 1997 (One of 750 selected per year from all over India)

4. Supervision of Research Activities

PhD Theses

- **Pankesh Patel** (UPMC [1], Inria-CORDI-S, started 10/10)
  Supervision : 90%
  PhD topic : "High-level programming abstractions for the Internet of Things"
  This PhD thesis focuses on the challenges of providing suitable abstractions for the different stakeholders involved in application development for the Internet of Things. I proposed this PhD research topic, and play a major part in supervising Pankesh in my capacity as co-adviser with Valérie Issarny, who is the adviser.
- **Sara Hachem** (UVSQ [2], Inria-CHOReOS, started 10/10)
  Supervision : 50%
  PhD topic : "Scalable Middleware for the Internet of Things"
  This PhD thesis is focused towards the handling the dual challenges of scale and heterogeneity presented by the Internet of Things. I co-supervise the work in this PhD thesis (with Valérie Issarny as the adviser), specifically the part focused on probabilistic protocols for registration, discovery, and composition of thing-based services.

Internships

- **Guilherme Nogueira** (Master student, University of Sau Paolo, Brazil, Inria-MURPHY, 04/12-09/12)
  Supervision : 100%
  Topic : "Facilitating the Specification of Fault Tolerance Requirements in Sensor Networks"
  The research in this internship focused on providing suitable models for high-level abstraction to specifying fault-tolerance requirements in networked sensing applications, and has led to in some very promising initial results, which we are in the process of submitting for review. This internship was performed as part of the ANR Blanc MURPHY project, where I am the Inria PI, and was done in collaboration with researchers at LAAS/CNRS. Guilherme has now returned to Brazil to continue his Masters studies.
- **Ajay Chhatwal** (Master student, Indian Institute of Technology (Banaras Hindu University), Varanasi, India, total 8 months during 2010 - 2012)
  Supervision : 100%
  Topic : "Enabling macroprogramming in sensing-augmented pervasive systems"

1. Université Pierre et Marie Curie, Paris
2. Université de Versailles Saint Quentin en Yvelines

This work, spanning three visits over two years, focused on providing high-level programming abstractions for applications developed on systems consisting both of embedded sensing and actuation elements as well as traditional resource-rich elements of the "traditional" Internet such as web and database servers. Ajay is now a research and development engineer with Arista Networks Inc., India.

– **Undergraduate Interns -** In addition to the above, I have also been 100% supervisor of undergraduate summer interns in 2009-12 time period. Notably, one of them —Mahanth Gowda— received a full scholarship for the PhD program at Duke University, USA, and is currently a student there.

Engineers

– **Iraklis Leontiadis** (*Ingénieur jeune diplômé*, Inria ADT *Srijan*, 10/09-09/11)
Supervision : 100%
Topic : *Srijan*– Data-driven macroprogramming for sensor networks
This position was supported by an Inria ADT to improve the *Srijan* toolkit —developed by me during the course of my PhD— which is now an open source Eclipse plugin enabling high-level application development of networked sensing applications. After finishing his engineer contract, Iraklis is currently a PhD student at Eurecom, France.

– **George Rosca** (*Ingénieur jeune diplômé*, Inria ADT Yarta, started 10/12)
Supervision : 100%
Topic : Yarta– Middleware for Mobile Social Ecosystems
This Inria ADT engineering support project, starting in October 2012, will allow us to improve the quality of the Yarta middleware that has been developed as a research prototype during our work on mobile social networking. Since the existing prototype was already used by students in Trinity College, Dublin, and UVSQ, we foresee a significant potential of adoption of Yarta by the community in the coming years.

5. Collective Responsibilities

Program Committee Member

– International Conference on Parallel and Distributed Systems, ICPADS 2009
– IEEE International Conference on High Performance Computing, HiPC 2010
– IEEE Communications Society Conference on Sensor and Ad Hoc Communications and Networks SECON 2009-2011
– IEEE International Conference on Intelligent Sensors, Sensor Networks and Information Processing, ISSNIP 2010, 2011
– International Conference on Sensor Systems and Software, S-Cube 2009-2012
– IEEE International Conference on Internet of Things, iThings 2012
– IEEE International Conference on Communications in China, ICCC 2012
– INSTICC International Conference on Sensor Networks, SENSORNETS 2012
– IFIP International Conference on Network and Parallel Computing, NPC 2012
– IEEE Workshop on Wireless Sensor Networks for Intelligent Transportation Systems, WSN4ITS 2012
– International Workshop on Software Engineering for Sensor Network Applications, SESENA 2012
– Doctoral Symposium of the ACM/IFIP/USENIX 13th International Conference on Middleware, Middleware 2012
– In addition to the above events, I have also served as a reviewer for academic journals including IEEE Transactions on Wireless Communications, IEEE Transactions on Computers, ACM Transactions on Sensor Networks, IEEE Transactions on Mobile Computing, Elsevier Journal on Applied Mathematical Modeling, Elsevier Journal on Computer Networks, and MDPI Sensors Journal.

Conference Organization

– Production Chair, International Conference on High Performance Computing, HiPC 2008-2012
– Web Publicity Chair, IEEE International Conference on Distributed Computing Systems, DCOSS 2008-2010

– Scholarships Co-Chair, International Conference on High Performance Computing, HiPC 2005 and HiPC 2006

Membership in Grant Review Boards
– Member of review board for EIT ICT labs 2013 call, Smart Spaces, and Cyber-Physical Systems tracks

General Academic Service
– Member, Computer Engineering PhD Student Council, Ming Hsieh Department of Electrical Engineering, University of Southern California, 2007 - 08
– Core Organizing Team Member, First EE Teaching Assistant training workshop, USC, September 2007
– Member, Provost's Graduate student Advisory Committee, University of Southern California, 2005 - 06
– Member, Students Advisory Committee, Indian Institute of Technology, Banaras Hindu University, 2002 - 2003

6. Collaborations, Mobility

Participation in Collaborative Research Projects
– **ANR Blanc Murphy** – *Dependability-focused Evaluation of Sensor Networks* [01/11-12/13]
Web : `http://cedric.cnam.fr/~sailhanf/murphy/`
Overview : Murphy aims at easing the development of dependable and pervasive applications built on top of robust wireless sensor networks. ARLES contribution is focused on the study of suitable abstractions to reason on faults, wireless sensor networks, data-centric and event-driven applications. I am the **Inria PI for this project**, and have been working closely with both academic and industrial collaborators, notably LAAS/CNRS in Toulouse, with whom we have had several student exchanges.
– **FP7 ICT IP CHOReOS** – *Large Scale Choreographies for the Future Internet* [10/10-09/13]
Web : `http://www.choreos.eu`
Overview : CHOReOS studies a dynamic development process, and associated methods, tools and middleware, to sustain the composition of services in the Future Internet. As part of the ARLES project-team that is the scientific leader of the project, I have worked closely with project partners in designing scalable middleware algorithms for service-oriented computing in the ultra-large scale, and highly heterogeneous Future Internet, with a special emphasis on the embedded IoT.
– **FP7 ICT NoE NESSoS** – *Network of Excellence on Engineering Secure Future Internet Software Services and Systems* [10/10-03/14]
Web : `http://www.nessos-project.eu`
Overview : The Network of Excellence on Engineering Secure Future Internet Software Services and Systems (NESSoS) aims at constituting and integrating a long lasting research community on engineering secure software-based services and systems. I am an active participant in this network of excellence, bringing my expertize in high-level abstractions for large-scale pervasive systems, including mobile social networks. We are currently starting collaborative research with KU Leuven, Belgium, on federated social networks as part of this work.

Bilateral Collaboration
– **PHC Ulysses** – *Middleware for Mobile Social Applications in Smart Urban Environments* [01/11-12/11]
Overview : This project aims at investigating how the exploitation of advanced ICTs in the field of mobile social networking can improve the quality of life of citizens. The project relies on the Yarta middleware developed as part of my research, which includes a flexible and expressive representational framework for social data, tools to develop application-specific data models, and a set of middleware components to manage social information in mobile environments. Being the **Inria PI for this project**, I traveled to Trinity College, Dublin for collaborative research, leading to the use of our middleware by their Masters students, as well as work on joint grant proposals under preparation now.

– **Uppsala University.** I have been invited several times to Uppsala University, Sweden, during 2010-2012 —including twice for seven days each— to collaborate with researchers there on "Formal foundations for non-functional guarantees for WSN macroprogramming". We are currently working on submitting our work for publication.
– **Other visits.** In addition to the above, I have made visits to Indian Institute of Science, Bangalore, India in December 2008 ; the Indian Institutes of Technology (IIT) Mumbai, Kanpur, Delhi, and Varanasi in January 2009. I also visited and presented my work at the University of Southern California in March 2011, and a proposal for an *Equipe Associé* in collaboration with them is under submission with Inria.

Industrial Contact
– **SmartGrains Inc., Paris.** Through our joint participation in the MURPHY project, I am currently exploring collaborative work with SmartGrains (www.smartgrains.com). Specifically, we are exploring the possible use of the *Srijan* toolkit for sensor network macroprogramming for fault injection and monitoring of their parking-garage management deployments in the Paris region.
– **Kaarya LLC., Los Angeles, USA.** Through my connections from my PhD period, I am in touch with the team at Kaarya (www.kaarya.com), and recently have visited their operations in Los Angeles. They have shown interest in my research on large scale mobile systems as regards to their cloud-based solutions for enabling communication between automotive dealers and their (mobile) customers.

7. Teaching

– **Course : Web sémantique, contenus et usages, Master 2 COSY level**
Location : University of Versailles Saint-Quentin en Yvelines (UVSQ)
Semesters : Spring 2011, Spring 2012
Description : I co-taught this course with Prof. Stéphane Lopes and Zoubida Kedad of UVSQ, where I covered topics related to the usage of semantic techniques in mobile social networking. The students were also introduced to the Yarta middleware developed at ARLES, and used it for their Masters project.
– **Course : Guest lectures on Macroprogramming in Sensor Networks, Masters level**
Location : Conservatoire National des Arts et Métiers (CNAM)
Semesters : Spring 2011, Spring 2012
Description : I have been invited for the past two years by Prof. Eric Gressier-Soudan of CNAM to deliver guest lectures as part of his course on embedded networked systems. My lectures (3-6 hours, depending on semester) included both theoretical and practical elements, with the students using the *Srijan* toolkit —developed as part of my research at Inria— during the class.
– **Course : EE 102L, Introduction to Digital Circuits**
Location : University of Southern California, Los Angeles, USA
Semesters : Fall 2003, Spring 2004, Spring 2005 (4 months each)
Description : For 20 hours per week, I assisted in the teaching of this undergraduate-level course on the introduction to digital circuits. As part of my responsibilities, I was solely in charge of the lab sessions, which included teaching the students concepts of TTL gates, as well as state machine and microcontroller design using FPGAs. I was also responsible for evaluating the lab reports, and guiding and evaluating the end-semester projects.
– **Course : EE 457x, Computer Systems Organization**
Location : University of Southern California, Los Angeles, USA
Semesters : Fall 2005 (4 months)
Description : For 20 hours per week, I assisted in the teaching of this senior undergraduate and beginning graduate course on computer systems architecture, including lessons in the MIPS pipeline. As part of my responsibilities, the introduction to digital circuits. As part of responsibilities, I taught discussion sessions in which I explained to students the concepts of single-cycle and multi-cycle CPU, virtual memory, and linear pipelining. I was also responsible for guiding them through their lab assignments. Additionally, I designed 50% of the assignments and examinations.

In recognition of my excellence in teaching at the University of Southern California, I was awarded the **Best Teaching Assistant award** by the Electrical Engineering Department at the University of Southern California in 2005. I was also a **core member of the organizing team of the first EE Teaching Assistant training workshop** at USC in September 2007, where I designed course material and assignments to train incoming teaching assistants in the electrical engineering department.

8. Diffusion of Scientific Information

- I have participated in two occasions during 2010-2012 in hosting the *stagiere de collège/lycée* during their one-day visit to Inria, and introduced them to the our research, in an easy to understand manner
- I presented our research as part of Inria delegation to visiting members of SICS (*Société Internationale des Conseillers de Synthèse*) [3], as part of the Inria "Rencontres des Tuileries" event in June 2011

9. Miscellaneous

- President, Association of Indian Students at USC, 2004-05
- Completed the Los Angeles Marathon, March 2006
- Member, IEEE, 2000 - present
- Member, ACM, 2008 - present

9. Publications

Articles in International Refereed Journals

[1] Animesh Pathak and Viktor K. Prasanna. Energy-Efficient Task Mapping for Data-Driven Sensor Network Macroprogramming. *IEEE Transactions on Computers*, 59(7) :955–968, July 2010.

[2] Ina Schaefer, Rick Rabiser, David Clarke, Lorenzo Bettini, David Benavides, Goetz Botterweck, Animesh Pathak, Salvador Trujillo, and Karina Villela. Software diversity : state of the art and perspectives. *International Journal on Software Tools for Technology Transfer*, October 2012.

Book Chapters

[3] Animesh Pathak and Viktor K. Prasanna. High-Level Application Development for Sensor Networks : Data-Driven Approach. In Sotiris Nikoletseas and José D.P. Rolim, editors, *Theoretical Aspects of Distributed Computing in Sensor Networks*, Monographs in Theoretical Computer Science. An EATCS Series, pages 865–891. Springer Berlin Heidelberg, January 2011.

Publications in Peer-Reviewed International Conferences

[4] Amol Bakshi, Animesh Pathak, and Viktor K. Prasanna. System-level support for macroprogramming of networked sensing applications. In *Int. Conf. on Pervasive Systems and Computing (PSC)*, 2005.

[5] Vasanth Krishna Namasivayam, Animesh Pathak, and Viktor K. Prasanna. Scalable parallel implementation of bayesian network to junction tree conversion for exact inference. In *Computer Architecture and High Performance Computing, 2006. SBAC-PAD'06. 18TH International Symposium on*, pages 167–176. IEEE, 2006.

[6] Animesh Pathak, Luca Mottola, Amol Bakshi, Gian Pietro Picco, and Viktor K. Prasanna. A compilation framework for macroprogramming networked sensors. In *Proc. of the the* 3^{rd} *Int. Conf. on Distributed Computing on Sensor Systems (DCOSS)*, 2007.

3. `http://www.prospective.fr`

[7] Luca Mottola, Animesh Pathak, Amol Bakshi, Viktor K. Prasanna, and Gian Pietro Picco. Enabling Scoping in Sensor Network Macroprogramming. In *Fourth IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, 2007.

[8] Animesh Pathak and Viktor K. Prasanna. Energy-efficient task mapping for data-driven sensor network macroprogramming. In *International Conference on Distributed Computing in Sensor Systems (DCOSS)*, June 2008.

[9] Amel Bennaceur, Gordon Blair, Franck Chauvel, Nikolaos Georgantas, Paul Grace, Falk Howar, Paola Inverardi, Valérie Issarny, Massimo Paolucci, Animesh Pathak, Romina Spalazzese, B. Steffen, Bertrand Souville, and Huang Gang. Towards an architecture for runtime interoperability. In *Proceedings of ISoLA 2010 - 4th International Symposium On Leveraging Applications of Formal Methods, Verification and Validation*, pages 206–220, Crete, Greece, 2010.

[10] Nikolaos Georgantas, Mohammad Ashiqur Rahaman, Hamid Ameziani, Animesh Pathak, and Valérie Issarny. A coordination middleware for orchestrating heterogeneous distributed systems. In Jukka Riekki, Mika Ylianttila, and Minyi Guo, editors, *Proceedings of GPC 2011 : International Conference on Grid and Pervasive Computing*, volume 6646 of *Lecture notes in computer science*, pages 221–232, Oulu, Finland, May 2011. Springer.

[11] Alessandra Toninelli, Animesh Pathak, and Valérie Issarny. Yarta : A Middleware for Managing Mobile Social Ecosystems. In Jukka Riekki, Mika Ylianttila, and Minyi Guo, editors, *Proceedings of GPC 2011 – International Conference on Grid and Pervasive Computing*, volume 6646 of *Lecture notes in computer science*, pages 209–220, Oulu, Finland, May 2011. Springer.

[12] Sara Hachem, Alessandra Toninelli, Animesh Pathak, and Valérie Issarny. Policy-based Access Control in Mobile Social Ecosystems. In *Proceedings of the IEEE International Symposium on Policies for Distributed Systems and Networks*, Pisa, Italy, June 2011. IEEE computer society.

[13] Animesh Pathak Ajay Chhatwal and Kaushal K. Shukla. Application development for the internet of things : Observations and challenges. In *Work in Progress session of IEEE International Conference on the Internet of Things, iThings 2012*, 2012.

Publications in Peer-Reviewed International Workshops

[14] Animesh Pathak, Luca Mottola, Amol Bakshi, Viktor K. Prasanna, and Gian Pietro Picco. Expressing sensor network interaction patterns using data-driven macroprogramming. In *Proc. of the* 3^{rd} *Int. Wkshp. on Sensor Networks and Systems for Pervasive Computing (PerSens - colocated with IEEE PERCOM)*, 2007.

[15] Alessandra Toninelli, Animesh Pathak, Amir Seyedi, Roberto Speicys Cardoso, and Valérie Issarny. Middleware Support for Mobile Social Ecosystems. In IEEE Computer Society Press, editor, *Proceedings of the 2nd IEEE International Workshop on Middleware Engineering (COMPSAC Workshops)*, Seoul, Korea, May 2010.

[16] Pete Sawyer, Animesh Pathak, Nelly Bencomo, and Valérie Issarny. How the Web of Things Challenges Requirements Engineering. In *Proceedings of the 3rd Workshop on The Web and Requirements Engineering at 12th International Conference on Web Engineering – ICWE 20102*, Berlin, Germany, July 2012.

[17] Sara Hachem, Animesh Pathak, and Valérie Issarny. Probabilistic registration for large-scale mobile participatory sensing. *IEEE International Conference on Pervasive Computing, PERCOM 2012*, 2012.

Other Publications

[18] Mahanth K. Gowda and Animesh Pathak. Supporting Heterogeneity in Data Driven Sensor Network Macroprogramming. *Poster in Second student research symposium on High Performance Computing (HiPC 2009)*, December 2009.

[19] Animesh Pathak and Mahanth K. Gowda. Srijan : a graphical toolkit for sensor network macroprogramming. *Demo Session of 7th joint meeting of the European software engineering conference and the ACM SIGSOFT symposium on The foundations of software engineering (ESEC/FSE)*, 2009.

[20] Pankesh Patel, Animesh Pathak, Thiago Teixeira, and Valérie Issarny. Towards Application Development for the Internet of Things. *Proceedings of the PhD Student Symposium of the ACM/IFIP/USENIX 12th International Middleware Conference*, December 2011.

(note that the above list does not include public project deliverables that I have written or edited ; a complete list is available at my website)

10. Technical development : Software and others

Srijan – Data-driven macroprogramming for sensor networks Macroprogramming is an application development technique for wireless sensor networks (WSNs) where the developer specifies the behavior of the system, as opposed to that of the constituent nodes. As part of our work in this domain, we are working on *Srijan*, a toolkit that enables application development for WSNs in a graphical manner using data-driven macroprogramming. *Srijan* can be used in various stages of application development : (1) Specification of application as a task graph, (2) Customization of the auto-generated source files with domain-specific imperative code, (3) Specification of the target system structure, (4) Compilation of the macroprogram into individual customized runtimes for each constituent node of the target system, and finally (5) Deployment of the auto generated node-level code in an over-the-air manner to the nodes in the target system.

The current implementation of *Srijan* targets both the Sun SPOT sensor nodes and larger nodes with J2SE. Most recently, *Srijan* also includes rudimentary support for incorporating Web services in the application being designed. The software is released under open source license, and available as an Eclipse plug-in at `http://code.google.com/p/srijan-toolkit/`. Currently, *Srijan* is being used by our partners in the MURPHY collaborative project as well as in classroom as part of our teaching activities.
Auto-appreciation. We rate *Srijan* 5/5 on audience, 4/4 on originality, 3/5 on maturity, 4/4 on evolution, and 4/5 on distribution according to the Inria rating scheme for software. We are currently preparing a dépôt APP for *Srijan*.

Yarta – Middleware for Supporting Mobile Social Applications We are developing the Yarta middleware framework for managing mobile social ecosystems, having a multi-layer middleware architecture consisting of modules, which will provide the needed functionalities, including : (1) Extraction of social ties from context (both physical and virtual), (2) Enforcement of access control to protect social data from arbitrary access, (3) A rich set of MSE management functionalities, using which mobile social applications can be developed.

Yarta adopts a graph-based model for representing social data, where nodes and arcs describe socially relevant entities and their connections. In particular, we exploit the Resource Description Framework (RDF), a basic Semantic Web standard language that allows representing and reasoning about social vocabulary, and creating an interconnected graph of socially relevant information from different sources.

The current implementation of the Yarta middleware targets both desktop/laptop nodes running Java 2 SE, as well as Android smartphones. The software is released under open source license at `https://gforge.inria.fr/projects/yarta/`. Yarta has been used by students of TCD and UVSQ for their Master projects.
Auto-appreciation. We rate Yarta 4/5 on audience, 4/4 on originality, 4/5 on maturity, 4/4 on evolution, and 4/5 on distribution according to the Inria rating scheme for software. We are currently preparing a dépôt APP for Yarta.

11. Technical Transfer Resulting from Research

The software tools developed as part of my research, specifically *Srijan* and Yarta, show the potential of technology transfer. I will leverage my connections with partners in industries (See Section 6 in Form 1) to

realize these tech. transfers in the near future.

In addition to the above, I am also the **Inria PI on the EIT ICT Labs Activity "TravelDashboard"** on a framework for personalised data collection, aggregation and delivery, as part of the "Intelligent Mobility and Transporation Systems" action line which is slated to begin in January 2013. This project is in collaboration with University College of London, Thales, Alcatel-Lucent, AMBIENTIC, Transport for London, and System@tic. Since the aim of the activity is *innovation*, and Inria is one of only two academic partners —and System@tic's explicit mandate in the project is business development— I foresee a strong possibility of the utilization of my research results in industrial context, including the possibility of tech. transfer.