

Maxime GUÉRIAU

Contact details

Citizenship: French – Age: 29
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Research topics

- Artificial intelligence
- Multi-agent systems
- Autonomous and distributed systems
- Cooperative Intelligent Transportation Systems (C-ITS)
- Microscopic traffic modeling and simulation
- Traffic control

Education

2013–2016 **PhD in computer science**, Université Claude Bernard Lyon 1 – **UCBL**, France
PhD thesis title : « *Multi-agent systems, self-organization and constructivist learning for Cooperative Intelligent Transportation Systems modeling and control* »
Directors: Salima HASSAS, Romain BILLOT – Supervisors: Frédéric ARMETTA, Nour-Eddin EL FAOUZI
Jury: Amal EL FALLAH SEGHRUCHNI, Giovanna DI MARZO SERUGENDO,
Hani MAHMASSANI and Patrick REIGNIER
2009–2013 **Engineering degree in computer science** – **UTBM**, France
Final internship: « *3D and artificial vision based vehicle localization and tracking* »
Supervisor: Cindy CAPPELLE – Laboratory: IRTES-SeT (EA-7274), Belfort, France

Research experience

Since Jan. 2018 **Research Fellow**, Distributed Systems Group – **Trinity College Dublin**
Project : SURPASS : How shared autonomous cars will transform cities
Supervisor: Ivana DUSPARIC
Activities :

- Traffic simulation for Shared Autonomous Vehicles (SAV)
- Development of new models for shared on-demand mobility
- Evaluation of the impact of SAVs on the city: traffic, riders and parking space

2016 – 2017 **Post-Doc. Research engineer**, LICIT¹ – IFSTTAR²-ENTPE³, Bron, France
Project : SCOOP@F : Cooperative Intelligent Transportation Systems deployment project
Activities :

- Impact study of the system on traffic flow (multi-criteria analysis from real data)
- Setup of a dedicated experimentation (20 vehicles, 12+ connected)
- Evaluation of advanced deployment stages through multi-agent simulation

2016 – 2017 **Part-time lecturer**, Université Claude Bernard Lyon 1 (UCBL), Lyon, France
Diploma: Master 1&2 Artificial Intelligence – Polytech Lyon (Engineering School)
2013–2016 **Doctoral studies** at **UCBL**, **LIRIS**⁴ (UMR 5205 CNRS) and **LICIT** (UMR T_E)
Activities :

- State of the art in connected/automated traffic modeling
- State of the art in constructivist learning
- C-ITS modeling based on dynamics coupling
- C-ITS multi-agent simulation framework implementation (MASCAT)
- Learning-based decentralized connected traffic control

¹Transportation and traffic engineering lab

²French institute of science and technology for transport, development and networks

³National school of public works

⁴Laboratoire d'InfoRmatique en Image et Systèmes d'information

Publications

International journals

- [Guériau2017a] Guériau M., Dafflon B., Gechter F. VIPS: A simulator for platoon system evaluation. *Simulation Modelling Practice and Theory* 77 (2017), pp 157 – 176.
- [Dafflon2017] Dafflon B., Guériau M., Gechter F. Using Physics Inspired Wave Agents in a Virtual Environment: Longitudinal Distance Control in Robots Platoon. *International Journal of Monitoring and Surveillance Technologies Research, Volume 5* (2017), pp 15 – 28.
- [Guériau2016] Guériau M., Billot R., El Faouzi N.-E., Monteil J., Armetta F., Hassas S. How to assess the benefits of connected vehicles? A simulation framework for the design of cooperative traffic management strategies. *Transportation Research Part C: Emerging Technologies* 67 (2016), pp 266 – 279.

International conferences

- [Gueriau2018] Guériau M., Billot R., El Faouzi N.-E., Monteil J. Contribution to the Assessment Methodology for Connected and Automated Vehicles on Traffic *Contribution to the Assessment Methodology for Connected and Automated Vehicles on Traffic* (2018).
- [Guériau2017b] Elchamaa R., Guériau M., Dafflon B. Chamoun R.-K., Ouzrout Y. A Local Leader election protocol applied to decentralized traffic regulation *29th IEEE International Conference on Tool with Artificial Intelligence (ICTAI)* (2017), IEEE, pp 1013 – 1020.
- [Guériau2016a] Guériau M., Hassas S., Armetta F., Billot R., El Faouzi N.-E. A constructivist approach for a self-adaptive decision-making system: application to road traffic control. *28th IEEE International Conference on Tool with Artificial Intelligence (ICTAI)* (2016), IEEE, pp 670 – 677.
- [Dafflon2016] Dafflon B., Guériau M., Gechter, F. WAVE: Wave Agents in a Virtual Environment; a proof of concept applied to longitudinal distance regulation in platoon control. *28th IEEE International Conference on Tool with Artificial Intelligence (ICTAI)* (2016), IEEE, pp 41 – 45.
- [Billot2014] Billot R., El Faouzi N.-E., Guériau M., Monteil J. Can C-ITS lead to the emergence of traffic management 2.0? *17th International IEEE Conference on Intelligent Transportation Systems (ITSC)* (2014), pp 483 – 488.
- [Guériau2015] Guériau M., Billot R., El Faouzi N.-E., Hassas S., Armetta F. Multi-agent dynamic coupling for cooperative vehicles modeling. *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence (DEMO Track)* (2015), AAAI Press, pp 4276 – 4277.
- [Guériau2014] Guériau M., Billot R., Hassas S., Armetta F., El Faouzi N.-E. An extension of movsim for multi-agent cooperative vehicles modeling. *2014 International Conference on Connected Vehicles and Expo (ICCVE)* (2014), IEEE, pp 859 – 860.

Languages

English : professional and scientific (papers, conferences)

French : mother-tongue

Computer skills

Programming languages, libraries and used software

Studied languages: Java, C++(Qt), C#, PHP, SQL
Taught languages: Java, C, SQL, PHP, Matlab
Data processing and visualization: R, Matlab
Documents and presentations: LaTeX, Beamer, Tikz
Frequently used for research work: Java, R, LaTeX
Integrated development environments : Eclipse, QtCreator, Unity3D
Development tools: Git, SVN

Software

MASCAT (*Multi-Agent Simulator for Connected and Automated Traffic*), a multi-agent microscopic traffic framework written in Java, designed for research work (Demonstration⁵ [Guériau2015]) and for teaching in a shared course at ENTPE⁶ and at EMSE⁷.

⁵Video of MASCAT: <https://youtu.be/uv60iu5hfMw>

⁶Practical work version of MASCAT: <http://maxime.gueriau.fr/entpe/>

⁷École des Mines de Saint-Etienne