

Dr. Dominique Gruyer | Senior Research Director (DR 1) in PICS-L laboratory

University Gustave Eiffel, IFSTTAR, department COSYS

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Academic background

Habilitation to Manage Research (HDR)

28 February 2014

Data Fusion : from environment perception to the cooperative systems
University of Evry Val d'Essonne, Option "Control Theory", France

PhD. In Systems Control (highly commended mention)

02 December 1999

*Study of the imperfect data processing for the multi-target tracking:
Applied to the road situations*
University of Technology of Compiègne, France

Master's degree In Systems Control

September 1995

University of Technology of Compiègne, France

Research activities

Deputy Director of the COSYS department for "**Autonomous and Connected Vehicle**" from **01/2019 to now**
Manager of the IFSTTAR's research program "**Autonomous and Connected Vehicle**" from **06/2018 to now**
Head of the LIVIC laboratory, department COSYS, IFSTTAR (5 years) from **01/2015 to 12/2019**
Scientific Director « perception and data fusion » in ESI-group (CIVITEC) from **04/2015 to now**
Senior Research Director in **Univ. Eiffel** (equivalent senior full professor) from **01/2020 to now**
Senior Research Director in **IFSTTAR** (equivalent senior full professor) from **01/2019 to 12/2019**
Research Director in **IFSTTAR** (equivalent full professor) from **10/2014 to 12/2018**
Scientific Expert and **co-founder** for the CIVITEC company (start-up IFSTTAR) from **2009 to 2012**
Senior researcher and team leader from **2006 to 2014**
Researcher in INRETS from **2001 to 2005**

Research fields: Autonomous vehicle, cooperative systems, ego-localization, environment perception, extended perception, sensors simulation for ADAS prototyping, risk assessment, AI for autonomous driving, failure detection and recognition.

Research skills: multi-sensor data fusion, belief theory, theories of uncertainties, theory of estimation.

Research valorization and supervising (Google scholar H index: 32)

Journal papers with peer-review process: **47**
Journal papers without peer-review process: **5**
International conferences with peer-review and proceedings: **168**
French conferences with reviewers and proceedings: **14**
Invited conferences and seminars: **46**
Books chapters: **14**
Research reports (French and international): **59**
Popularisations and interviews: **35**
Patents, License agreements: **8**
Start-up: CIVITEC (now a subsidiary of ESI group) **1**

Search terms	Source	Papers	Cites	Cites/year	h	g	hi,norm	hi,annual	hA	acc10	Search date	Cache date
✓ Dominique Gruyer	Google Scholar	245	4773	207.52	32	62	18	0.78	12	14	10/04/2022	10/04/2022

Post Doctorate:	7
PhD thesis:	14 defended,
(1 co-tutelle, 1 ITEP, 1 IFSTTAR with LEOST, 1 associated with UBC-Canada, 1 CEREMA-UGE)	5 in progress
Master/engineer internships:	35
Research engineers (short term contract):	18

Involvement in juries, authorities, and committees

Involvement in PhD thesis juries:	35
Involvement in HDR thesis juries:	2

Involvement in Scientific committees

- **Expert** for BPI. Expertise and review of project in the call “PIA4 Mobilités routières automatisées”, 2022.
- **Committee Member of HCERES** for the evaluation of LITIS laboratory in Rouen (July 2021 – December 2021; evaluation 19-21 October 2021)
- **Committee Member of the Burgundy University Selection Advisory Commission**, engineer school ISAT (NEVER), laboratory DRIVE. May 2021.
- **International expert** for Austrian project calls (**Austrian Research Promotion Agency**): Oct 2020 to Nov 2020 : Reviewer for FuE-Infrastrukturförderung, Fachbegutachtung 3.AS - Austrian research pro-motion agency (FFG) - Reviewer for the "COMET-projects": project ESSENSE-AD (European Set of Referenced Perception Sensor Data for Empowering Automated Driving).
- **Sciences and Technologies faculty committee** of University Evry Val d'Essonne (from 2019)
- **Member of the scientific domain 2 committee** (Communication and autonomous vehicles) of VEDECOM (from 2018)
- **Committee of experts** (Selection Advisory Commission) for Mines Paris Tech in 2018
- **Committee member** of the Paris-Saclay doctoral school (domain 1: Information and Communication Sciences and Technologies) from 2017 to 2019.
- **Scientific committee** of the ADAS group from June 2016 (group of companies working on the development of cooperative and active ADAS for road safety)
- **Nominated member of the CS** (Committee of experts) 61st section of the University Paris Sud XI - Orsay from 2004 to 2006, 2008-2009
- **Member of the CCSU** (University Selection Advisory Commission) 61st commission section of the University Paris Sud XI - Orsay in 2011 to 2013, the University of Evry Val d'Essonne in 2012, and the INSA Rouen Commission in 2012.
- **International expert** for AUTO21, Canada (from 2010 to 2014)

Involvement in editorial committees and conference committees:

2012:	RFIA-VISAGE Program Committee (http://visage.univ-bpclermont.fr)
2013 :	Editorial committee for the special issue IJNCS 2013 in the Journal of Intelligent Systems .
2013-now:	International Committee and Associate Editor for the International IEEE Intelligent Vehicle Symposium (IV) .
2018:	Member of the International Committee and Associate Editor of the IEEE ITSC conference
2016:	Member of the International Committee and Associate Editor of the IFAC / IEEE CPHS Conference (Florianopolis, December 2016, Brazil)
2018-2020:	Guest editor for the special issue “Sensors data fusion”, journal SENSORS
2020-now:	Guest editor for the special issue “Sensors and Sensor Fusion for Future Mobility Systems”, journal SENSORS
2019-now:	Member of the editorial board of the journal SENSORS
2023:	Member of the scientific committee for the future conference IEEE Models and Technologies for ITS (MT-ITS), 2023 in Nice, France.

Projects, contracts, and expertise

Projects:	12 (French), 11 (European), 2 (International: Canada and Australia)
Contracts:	>8 (Renault, FAAR, Transdev, ESI, VEDECOM, CTA, Alstom ...)
Expertises:	>10 (Fujitsu, Renault, DGA, ANR, ANRT, BPI, ESI-CIVITEC, VEDECOM, DGITM, CGEDD...)

Awards

1999: highly commended mention for the PhD thesis (only 10% of the French PhD thesis)

2011-2015: Award of Scientific Excellence (PES) awarded by INRETS in 2011 for 4 years

2 journal papers and 4 international conference papers have been nominated or awarded:

- Jamil Fayyad, Mohammad Jaradat, **Dominique Gruyer**, and Homayoun Najjaran, « Deep Learning Sensor Fusion for Autonomous Vehicles Perception and Localization: A Review. », in SENSORS journal for the special issue « Sensor Data Fusion for Autonomous and Connected Driving », 2020. **Nominated for 2020 best paper award.**
- L. Rivoirard, M. Wahl, P. Sondi, M. Berbineau, and **D. Gruyer**, “CBL: A Clustering Scheme for VANETs.” in The 6th International Conference on Advances in Vehicular Systems, Technologies and Applications (VEHICULAR 2017), July 23 - 27, 2017 - Nice, France. **Best paper award**
- **D. Gruyer**, S. Demmel, B. d’Andrea-Novel, G. Larue, A. Rakotonirainy, « Simulating Cooperative Systems Applications: a New Complete Architecture », in International Journal of Advanced Computer Science and Applications (IJACSA), Volume 4, 2013. **(Best paper award for Volume 4, 2013)**
- S. Glaser B. Vanholme, S. Mammari, **D. Gruyer**, “Probability and risk maneuver planning for collision avoidance”, in FAST-ZERO (Future Active Safety Technology) 2011, Tokyo, Japan, September 5-9, 2011. **(nominated for the best paper award)**
- A. Ndjeng Ndjeng, A. Lambert, **D. Gruyer** and S. Glaser, “Experimental Comparison of Kalman filters for vehicle localization”, In Proceedings IEEE international Symposium on Intelligent Vehicles (IV’09), Xi’an Shaanxi, China, 3-5 June 2009. **(nominated for the best poster award)**
- A. Lambert, **D. Gruyer**, B. Vincke, E. Seignez, « Outdoor Vehicle Localization by Bounded-Error State Estimation », in IROS’09, October 2009, Saint Louis, USA. **(Award for Finalist of the best paper award).**

Main international activities

Queensland University of technology (Brisbane, Australia) , lab **CARRS-Q** **from 2004 to now**
Common project (FAST), PhD co-tutelles, journal and conference papers, building of a LIA (Associated International Laboratory) in progress (submission in March 2022)

University of Sherbrooke (Sherbrooke, Canada), lab **LIV** **from 2009 to now**
Common project (CooPerCom), co-supervising of 3 PhD thesis, journal and conference papers, AUTO21 international expert (from 2010 to 2014)

University of Tongji (Shanghai, China) **from 2016 to now**
High End Foreign Expert in China (2016, 2018, 2019), Foreign expert and invited professor (2017), journal papers, Cai Yuan Pei (2018-2021, 1 PhD thesis in co-tutelle), teachings and seminars ...

University of British Columbia (Kelowna, Canada), lab **ACIS** **from 2016 to now**
Associated PhD thesis, student hosting, invited professor, journal and conference papers, seminar ...

Austrian research promotion agency (FFG) **from 2020 to now**
International Expert Austrian project calls: Reviewer for FuE-Infrastrukturförderung, Fachbegutachtung 3.AS - Austrian research promotion agency (FFG). COMET-projects call.

Teaching activities

UTEC, University of Technology and consular teaching, **(Le) (Tu) (La)**
Chamber of Commerce and Industry of Meaux-Melun
2000: computer science, Digital electronic, Algorithmic, Computer architecture

University of Technology of Compiègne (engineer degree) **(Le) (Tu) (La)**
1995-2003: Human/Machine communication, AI and problem solving, Virtual Reality, Computer sciences, Digital electronic and microprocessor, introduction to programming, compilation techniques

University Paris XI (Orsay) (engineer and master degree) **(Le) (Tu) (La)**
2013-2015: “simulation of autonomous systems”, **responsible** of the module, POLYTECH Paris Sud.
2002-2013: « Data fusion for the obstacles detection and tracking ». Master SETI (Electronic System and data processing).

National school of Mines de Paris (engineer) (La)

2005-2021: Teaching in the MAREVA option (Vision, morphology, Robotic and control theory).

University Evry Val d'Essonne (master degree) (Le) (Tu) (La)

2016-2022: responsible of the module « Localisation, map, path planning », master « Mobil Autonomous Systems ».

2020-2022: «Extended perception», master « Mobil Autonomous Systems ».

2005-2012: « The technics of data fusion for the embedded ego-positioning », Master RVSI (VR and intelligent systems).

IFP SCHOOL (master degree) (Le)

2018-2022: module PowerTrain, "Close and Far perception: A key issue Management, Processing and Fusion of sensors and data imperfections".

ENSTA (master degree) (Le)(La)

2019-2021: module « Localisation/map/path planning» in the specialized master « Project management in Electrical Infrastructure, Electrical Vehicles, and Autonomous Vehicles » (IRVEA).

Tongji University (China) (Post graduate: master and PhD) (Le)

2016: Lectures 1, 2 and 3: From the connected and perceptive vehicle toward the autonomous car. Issue, Methods, and applications

"Close and Far perception: A key issue. Management, Processing and Fusion of sensors and data imperfections"

2018: Lectures 1, « Is autonomous driving the silver bullet for safety, consumption, and traffic congestion issues. Benefits and weakness"

2021: 6 lectures about automated vehicles, perception systems, multi-sensor fusion, cooperative systems ...

Changsha University of Science & Technology (Post graduate : master and PhD) (Le)

2018: Lecture in the school of traffic & transportation engineering, « Is autonomous driving the silver bullet for safety, consumption, and traffic congestion issues. Benefits and weakness".

Languages

French: mother tongue

English: fluent

Chinese: A1.1 level

Some relevant publications about my research

Olivier Orfila, **Dominique Gruyer**, et Rémi Saint, « Automated Driving, a Question of Trajectory Planning », chapitre 3 de l'ouvrage "From AI to Autonomous and Connected Vehicles, Advanced Driver-Assistance Systems (ADAS)". Bapin, T. and Bensrhair, A. (eds.) (2021). ISTE Ltd., London, and John Wiley and Sons, New York. Série : Digital Science. ISBN: 9781786307279, Publication Date: August 2021, Hardcover 284 pp. <http://iste.co.uk/book.php?id=1800>

Dominique Gruyer, Serge Laverdure, Jean-Sébastien Berthy, Philippe Desouza, Mokrane Hadj-Bachir, «From Virtual to Real, How to Prototype, Test, Evaluate and Validate ADAS for the Automated and Connected Vehicle? », chapitre 4 de l'ouvrage "From AI to Autonomous and Connected Vehicles, Advanced Driver-Assistance Systems (ADAS)". Bapin, T. and Bensrhair, A. (eds.) (2021). ISTE Ltd., London, and John Wiley and Sons, New York. Série: Digital Science. ISBN: 9781786307279, Publication Date: August 2021, Hardcover 284 pp. <http://iste.co.uk/book.php?id=1800>

Wei Xu, Rémi Saint, **Dominique Gruyer**, Olivier Orfila, « Safe vehicle trajectory planning in an autonomous decision support framework for emergency situations. », in Applied Sciences journal, Special Issue "Human-Computer Interaction: Theory and Practice". Published 09th July 2021. Appl. Sci.2021,11, 6373. <https://doi.org/10.3390/app1114637>, Impact Factor: 2.679

Dominique Gruyer, Olivier Orfila, Sébastien Glaser, Abdelmenname Hedhli, Nicolas Hautière and Andry Rakotonirain, "Are Connected and Autonomous Vehicles the silver bullet for future transportation issues? Benefits and weaknesses on Safety, Consumption, and Traffic congestion.", in Frontiers in Sustainable Cities, Special Collection "Advances in Road Safety Planning", 8th January 2021.

Jamil Fayyad, Mohammad Jaradat, **Dominique Gruyer**, and Homayoun Najjaran, « Deep Learning Sensor Fusion for Autonomous Vehicles Perception and Localization: A Review.», in SENSORS journal for the special issue « Sensor Data Fusion for Autonomous and Connected Driving”. Volume 20, issue 15. Published 29th July 2020. DOI: <https://doi.org/10.3390/s20154220>, *Impact factor: 3.275*

Farid Bounini, Denis Gingras, Hervé Pollard, **Dominique Gruyer**, “From Simultaneous Localization And Mapping to Collaborative Localization for Intelligent Vehicles”, in IEEE Intelligent Transportation Systems Magazine, 3th March 2020. 10.1109/MITS.2019.2926368. *Impact factor: 3.294*

Meiting TU, Wenxiang Li, Minchao TU, Olivier Orfila, **Dominique Gruyer**, « Improving Ridesplitting Services Using Optimization Procedures on a Shareability Network: A Case Study of Chengdu”, in Journal “Technological Forecasting & Social Change”, Accepted 29th August 2019. CiteScore: 4.32, *Impact Factor: 3.815*.

Laurène Claussmann, Marc Revilloud, **Dominique Gruyer**, and Sébastien Glaser, “A Review of Motion Planning for Highway Autonomous Driving”, in IEEE Transactions on Intelligent Transportation Systems pp(99):1-23, DOI: 10.1109/TITS.2019.2913998, May 2019. *Impact factor: 5.744*.

Xuanpeng Li, Dong Wang, Huanxuan Ao, Rachid Belaroussi, **Dominique Gruyer**, « Fast 3D Semantic Mapping in Road Scenes.», in Applied Sciences 9(4):631. February 2019. DOI: 10.3390/app9040631. *Impact Factor: 1.689*

Jessica Van Brummelen, Marie O’Brien, **Dominique Gruyer**, and Homayoun Najjaran, “Autonomous Vehicle Perception: The Technology of Today and Tomorrow”, in Transportation Research Part C: Emerging technologies. February 2018. *Impact Factor: 3.805*

Lucas Rivoirard, Martine Wahl, Patrick Sondi, Marion Berbineau, **Dominique Gruyer**, “Chain-Branch-Leaf: A clustering scheme for vehicular networks using only V2V communications.” in Ad Hoc Networks (2017), Volume 67, December 2017, Elsevier, <https://doi.org/10.1016/j.adhoc.2017.10.007>. *Impact Factor: 3.047*

Dominique Gruyer, Valentin Magnier, Karima Hamdi, Laurène Claussmann, Olivier Orfila, Andry Rakotonirainy, “Perception, information processing and modeling: critical stages for autonomous driving applications », in Annual Reviews in Control, volume 44, pages 323-341, November 2017. *Impact Factor: 2.627*

Olivier Orfila, **Dominique Gruyer**, Karima Hamdi, Sébastien Glaser, , “Safe and Ecological Speed Profile Planning Algorithm for Autonomous Vehicles Using a Parametric Multiobjective Optimization Procedure”, accepted in the fourth international symposium on Future Active Safety Technology (FAST-ZERO 2017), Nara Kasugano International Forum, Nara, Japan, 18-22 September 2017

Olivier Orfila, Camila Freitas Salgueiredo, Guillaume Saint Pierre, Haihao Sun, Ye Li, **Dominique Gruyer**, Sébastien Glaser, “Fast computing and approximate fuel consumption modeling for Internal Combustion Engine passenger cars”, in Transportation Research Part D: Transport and Environment, Elsevier, Volume 50, January 2017, Pages 14–25. *Impact Factor: 2.341*

Dominique Gruyer, Ines Ben Jemaa, Sebastien Glaser, Philippe Desouza, Jean-Sebastien Barreiro, Serge Laverdure « Simulation Platform for the Prototyping, Testing, and Validation of Cooperative Intelligent Transportation Systems. », 23rd ITS World Congress, Melbourne, Australia, 10–14 October 2016.

Dominique Gruyer, Sébastien Demmel, Valentin Magnier, Rachid Belaroussi, « Multi-Hypotheses Tracking using the Dempster–Shafer Theory, application to ambiguous road context.», in Information Fusion, Elsevier, Volume 29, May 2016, Pages 40-56. DOI: 10.1016/j.inffus.2015.10.001. *Impact Factor: 3.681*

Dominique Gruyer, Sébastien Demmel, Brigitte d’Andrea-Novel, Grégoire Larue, Andry Rakotonirainy, « Simulating Cooperative Systems Applications: a New Complete Architecture”, in International Journal of Advanced Computer Science and Applications (IJACSA), Volume 4, 2013. (**Best paper award for Volume 4, 2013**) *Impact Factor: 1.32*

Benoit Vanholme, **Dominique Gruyer**, Benoit Lusetti, Sebastien Glaser, Said Mammar, “Highly automated driving on highways based on legal safety”, in IEEE Transaction on Intelligent Transportation Systems, No 14 (1), pp 333-347, 2013. *Impact Factor: 2.472*