

Alice Plebe

Last update: January 10, 2022

CONTACT INFORMATION E-mail: alice.plebe@unitn.it
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CURRENT POSITION **Postdoc** 2021 – present
Department of Industrial Engineering, University of Trento, Italy
Modeling of cognitive-inspired perception for autonomous driving agents.

EDUCATION **PhD in Information and Communication Technology** 2021
University of Trento, Italy
Development of cognitive-inspired deep neural networks for visual perception in autonomous driving. The work was part of the European H2020 Dreams4Cars project.
Advisor: Prof. Mauro Da Lio

Visiting Research 2020
TU Delft, Netherlands
Research collaboration with the Intelligent Vehicles group from the department of Cognitive Robotics.
Supervisor: Dr. Julian F. P. Kooij

Research scholarship 2017
University of Catania, Italy
Development of simulation algorithms for hazardous fire propagation in industrial plants. The work was part of the European H2020 SafeMod project.
Principal Investigator: Prof. Sebastiano Battiato

Master's degree in Computer Science, 110/110 cum laude 2016
University of Catania, Italy
Development of multi-objective genetic algorithms for interior illumination design.
Advisor: Dr. Mario Pavone

Bachelor's degree in Computer Science, 110/110 cum laude 2014
University of Catania, Italy
Development of computational geometric algorithms for real-time calculation of minimum-separation distance between poliedra.
Advisor: Prof. Vincenzo Cutello

AWARDS **Best Student Paper Award** 2019
5th International Conference on Vehicle Technology and Intelligent Transport Systems
for the paper entitled “Mental Imagery for Intelligent Vehicles”.

- SUMMER SCHOOLS **International Summer School on AI and Games** 2018
University of Crete, Chania, Greece
 40 hours of lectures focusing on the uses of artificial intelligence techniques for playing games, generating content, and modeling players.
- Training on Deep Learning for Autonomous Vehicles – Perception** 2018
NVIDIA Deep Learning Institute
 8 hours of instructor-led training on the development of autonomous vehicle applications using deep neural architectures and specialized NVIDIA computing platforms.
- International Summer School on Deep Learning** 2017
University of Deusto, Bilbao, Spain
 50 hours of lectures covering theoretical and application aspects of deep learning, including computer vision, speech recognition, and language processing.
- JOURNALS M. Da Lio, R. Donà, G. P. Rosati Papini, and A. Plebe, “The biasing of action selection produces emergent human-robot interactions in autonomous driving,” *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 1254–1261, 2022
- G. P. Rosati Papini, A. Plebe, M. Da Lio, and R. Donà, “A reinforcement learning approach for enacting cautious behaviours in autonomous driving system: Safe speed choice in the interaction with distracted pedestrians,” *IEEE Transactions on Intelligent Transportation Systems*, pp. 1–18, 2021 (early access)
- A. Plebe and M. Da Lio, “On the road with 16 neurons: Towards interpretable and manipulable latent representations for visual predictions in driving scenarios,” *IEEE Access*, vol. 8, pp. 179716–179734, 2020
- A. Plebe, M. Da Lio, and D. Bortoluzzi, “On reliable neural network sensorimotor control in autonomous vehicles,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 21, pp. 711–722, 2020
- A. Plebe and G. Grasso, “Conceptual integrity without concepts,” *International Journal of Software Engineering and Knowledge Engineering*, vol. 28, no. 7, pp. 955–981, 2018
- BOOK CHAPTERS A. Plebe and M. Da Lio, “Neurocognitive-inspired approach for visual perception in autonomous driving,” in *Communications in Computer and Information Science*, vol. 1217, pp. 113–134, Springer, Cham, 2021
- A. Plebe, V. Cutello, and M. Pavone, “Optimizing costs and quality of interior lighting by genetic algorithm,” in *Studies in Computational Intelligence* (C. Sabourin, J. J. Merelo, K. Madani, and K. Warwick, eds.), vol. 829, pp. 19–39, Springer, Cham, 2019
- CONFERENCES A. Plebe, G. P. Rosati Papini, and M. Da Lio, “Cognitive-inspired perceptual model for driving automation,” in *Proceedings of the 2nd Italian Conference on Robotics and Intelligent Machines (I-RIM)*, 2020
- A. Plebe and M. Da Lio, “Visual perception for autonomous driving inspired by convergence-divergence zones,” in *Proceedings of the 11th International Symposium on Image and Signal Processing and Analysis (ISPA)*, pp. 204–208, IEEE, 2019

A. Plebe and M. Da Lio, “Variational autoencoder inspired by brain’s convergence-divergence zones for autonomous driving application,” in *Proceedings of the 20th International Conference on Image Analysis and Processing (ICIAP)*, vol. 11751 of *Lecture Notes in Computer Science*, pp. 367–377, Springer, Cham, 2019

A. Plebe, R. Donà, G. P. Rosati Papini, and M. Da Lio, “Mental imagery for intelligent vehicles,” in *Proceedings of the 5th International Conference on Vehicle Technology and Intelligent Transport Systems (VEHITS)*, pp. 43–51, Science and Technology Publications, 2019

A. Plebe, G. P. Rosati Papini, R. Donà, and M. Da Lio, “Dreaming mechanism for training bio-inspired driving agents,” in *Proceedings of the 2nd International Conference on Intelligent Human Systems Integration (IHSI)*, pp. 429–434, Springer, Cham, 2019

M. Da Lio, A. Plebe, D. Bortoluzzi, G. P. Rosati Papini, and R. Donà, “A system for human-like driving learning,” in *Proceedings of the 25th Intelligent Transport Systems World Congress (ITSWC)*, 2018

M. Da Lio, A. Plebe, D. Bortoluzzi, G. P. Rosati Papini, and R. Donà, “Autonomous vehicle architecture inspired by the neurocognition of human driving,” in *Proceedings of the 4th International Conference on Vehicle Technology and Intelligent Transport Systems (VEHITS)*, pp. 507–513, Science and Technology Publications, 2018

A. Plebe, V. Cutello, and M. Pavone, “Evolving illumination design following genetic strategies,” in *Proceedings of the 9th International Joint Conference on Computational Intelligence (IJCCI)*, pp. 289–296, Science and Technology Publications, 2017

A. Plebe and M. Pavone, “Multi-objective genetic algorithm for interior lighting design,” in *Proceedings of the 3rd International Workshop on Machine learning, Optimization, and Big Data (MOD)*, vol. 10710 of *Lecture Notes in Computer Science*, pp. 222–233, Springer, Cham, 2017

A. Plebe and G. Grasso, “Particle physics and polyedra proximity calculation for hazard simulations in large-scale industrial plants,” in *Proceedings of the 12th International Conference of Computational Methods in Sciences and Engineering (ICCMSE)*, pp. 090003–1–090003–4, American Institute of Physics Publishing, 2016

WORKSHOPS

A. Plebe, J. F. Kooij, G. P. Rosati Papini, and M. Da Lio, “Occupancy grid mapping with cognitive plausibility for autonomous driving applications,” in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, pp. 2934–2941, 2021

A. Plebe and M. Da Lio, “A cognitively informed perception model for driving,” in *Towards Cognitive Vehicles: is bio-inspiration helpful? – Workshop at the International Conference on Intelligent Robots and Systems (IROS)*, 2019

A. Plebe, “Mental imagery for intelligent vehicles,” in *Algorithmic, Legal, and Societal Challenges for Autonomous Driving – Workshop at the IEEE Intelligent Vehicles Symposium (IV)*, 2019

PROFESSIONAL EXPERIENCE	<p>Production of 3D computer graphics animations 2017 <i>Morpheos Srl, Catania, Italy</i> Virtual presentation of a smart device for domotics application.</p> <p>Production of 3D computer graphics animations 2015 <i>Temix Communication Engineering, Catania, Italy</i> Virtual demonstration of a communication and surveillance system for homeland security, simulating war scenarios.</p> <p>Internship on Software development 2013 <i>NCE Network Consulting Engineering, Catania, Italy</i> Development of Python and XML modules for the open-source business management software OpenERP.</p>
FORENSIC EXPERIENCE	<p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2021 Criminal proceeding 9100/2020 R.G.N.R./mod.21 of Court in Catania, Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2019 Criminal proceeding 4853/2018 R.G.N.R./mod.21 of Court in Pordenone, Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2018 Criminal proceeding 2089/2018 R.G.N.R./mod.21 of Court in Vicenza, Italy.</p> <p>Forensic 3D virtual reconstruction for the Defence Attorney. 2018 Criminal proceeding 12604/2016 R.G.N.R./mod.21 of Court in Palermo, Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2017 Criminal proceeding 3013/2016 R.G.N.R./mod.21 of Court in Caltanissetta, Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2017 Criminal proceeding 1504/2017 R.G.N.R./mod.21 of Court in Siracusa, Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2016 Criminal proceeding 3942/2016 R.G.N.R./mod.21 of Court in Busto Arsizio (VA), Italy.</p> <p>Forensic 3D virtual reconstruction for the Defence Attorney. 2016 Criminal proceeding 376/2014 R.G.N.R./mod.21 of Court in Lanusei (NU), Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2015 Criminal proceeding 9340/2015 R.G.N.R./mod.21 of Court in Busto Arsizio (VA), Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2015 Criminal proceeding 1411/2015 R.G.N.R./mod.21 of Court in Catania, Italy.</p> <p>Forensic 3D virtual reconstruction for the Public Prosecutor's office. 2015 Criminal proceeding 7515/2014 R.G.N.R./mod.21 of Court in Busto Arsizio (VA), Italy.</p> <p>Forensic 3D virtual reconstruction for NoviaCOM SC. 2014 Criminal proceeding 30/2011 R.G.N.R./mod.21 of Court in Siracusa, Italy.</p>
LANGUAGES	<p><i>English:</i> C1 level – IELTS Academic Certification <i>Italian:</i> native</p>