

Emanuele PLEBANI

PERSONAL DATA

LOCATION: Indianapolis, IN
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GITHUB: [Banus](#)
PUBLICATIONS: [Google Scholar](#)

MACHINE LEARNING ENGINEER

Machine learning engineer with industry and academic experience in segmentation, object detection, NLP, 3D reconstruction and on-device inference. Demonstrated experience in the development and maintenance of large software projects. Proven ability providing leadership, team mentoring, research and development while managing heavy workloads and delivering features under tight deadlines.

SKILLS

Languages: PYTHON, C/C++, JAVASCRIPT, PERL, JAVA, HASKELL
Frameworks: TENSORFLOW, KERAS, PYTORCH, ONNX, OPENCV
Platforms and Tools: ANDROID, VS CODE, GIT
Others: machine learning, language models, image segmentation, visual search, model compression, software engineering

PROFESSIONAL EXPERIENCE

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| MAY 2022
AUG 2022 | Research scientist intern at META, Redmond (WA) <ul style="list-style-type: none">• Estimating prediction intervals in deep eye tracking models• Develop out-of-distribution approaches to identify anomalous training sequences |
| MAY 2024
JAN 2020 | Research Assistant at IUPUI, Indianapolis Supervisor: Prof. M. DUNDAR <ul style="list-style-type: none">• Classification of mineral signatures in hyperspectral images from the CRISM Mars experiment using Bayesian models, deep models, SVM, random forests• Segmentation of different cell and nerve structures in neurohistological TEM images using U-Net• Investigating Bayesian models for problems with imbalanced classes and zero-shot learning in segmentation and hyperspectral classification• Automated tagging and summarization for medical notes by fine-tuning language models (RNNs and Transformers)• Design and implement an Android app giving context-based message suggestions to blind/visual impaired people |
| JAN 2020
JUN 2014 | Advanced Research Engineer at STMICROELECTRONICS, Milan <ul style="list-style-type: none">• Design and development of the X-Cube-AI back-end, a tool to port neural networks from different deep learning toolboxes to STMicroelectronics platforms• Training in Keras (Python) and implementation in C of deep learning solutions for sensor data classification and activity recognition on microcontrollers• Design and training of binary-valued neural networks for activity recognition• Developed an Android application for the collection of datasets from sensor data via Bluetooth and automated the data cleaning step• Development, implementation and optimization of computer vision algorithms for visual search and object detection• Collaborations with Italian universities on sensor networks, unsupervised learning and computer vision applications (e.g. SLAM) |

OCT 2013	Research contractor at STMICROELECTRONICS, Milan
OCT 2012	<ul style="list-style-type: none"> • Worked on an improved visual search algorithms with improved localization, multiple object search and continuous tracking • Optimized an interest point detector, three times the speed of the reference CDVS algorithm with the same accuracy; joint patent ST/Politecnico di Milano • Contributed in starting the MPEG CDVA standard for search on video streams and object classification
MAY 2014	Research Assistant at POLITECNICO DI MILANO, Milan
OCT 2011	<ul style="list-style-type: none"> • Development and implementation of content-based image retrieval algorithms for the MPEG CDVS standard • Person in charge of the deliverables assigned to Politecnico di Milano in the European Project ASTUTE ARTEMIS • Advised theses on visual odometry using the trifocal tensor on omnidirectional images and robust plane detection in point clouds

EDUCATION

MAY 2024	Ph.D in COMPUTER SCIENCE, Purdue University GPA: 4/4 Advisor: Prof. Mehmet DUNDAR
JUL 2011	BA + MS in COMPUTER SCIENCE ENGINEERING, Politecnico di Milano 100/100 <i>First Class Honors</i> Major: Engineering of Computing Systems

AWARDS

APR 2024	Gersting's Award for an Outstanding Graduate Student - IUPUI
FEB 2014	Prize for Best Demo in the GITI MMSP Conference (Italian Chapter IEEE Signal Processing)
1997 – 1999	National level in the MATEpristem Mathematics Competition

SELECTED PUBLICATIONS

- [1] E. Plebani, N. Biscola, L. Havton, B. Rajwa *et al.*, “High-throughput segmentation of unmyelinated axons by deep learning”, *Scientific Reports* 12, no. 1 (2022): 1198.
- [2] E. Plebani, B. L. Ehlmann, E. K. Leask, V. K. Fox, and M. M. Dundar, “A Machine Learning Toolkit for CRISM Image Analysis”, *Icarus* 376 (2022): 114849.
- [3] P. Karimi, E. Plebani, D. Bolchini. “Textflow: Screenless access to non-visual smart messaging.” In 26th International Conference on Intelligent User Interfaces, pp. 186-196. 2021.
- [4] M. Paracchini, E. Plebani, M.B. Iche, D. Pau and M. Marcon, “Embedded real-time visual search with visual distance estimation.” *Image Analysis and Processing-ICIAP* September 11-15, 2017.
- [5] M. Paracchini, A. Schepis, M. Marcon, M. Falchetto, E. Plebani, D. Pau. “Accurate omnidirectional multi-camera embedded structure from motion.” *RTSI* 2016, pp. 1-6.
- [6] A. De Vita, G.D. Licciardo, L. Di Benedetto, D. Pau, E. Plebani and A. Bosco, “Low-power design of a gravity rotation module for HAR systems based on inertial sensors.” *ASAP*, 2018, pp. 1-4.
- [7] A. Nicosia, D. Pau, D. Giacalone, E. Plebani, A. Bosco, A. Iacchetti, “Efficient light harvesting for accurate neural classification of human activities”, *ICCE*, 2018, pp. 1-4
- [8] D. Tome, L. Bondi, E. Plebani, L. Baroffio, D. Pau, S. Tubaro, “Reduced Memory Region Based Deep Convolutional Neural Network Detection”, *arXiv*: 1609.02500