Mario **Avolio**

Computer & Robot Vision · Artificial Intelligence

(+39) 3791944042 | contact@marioavolio.it | marioavolio.it | MarioAvolio | MarioAvolio | MarioAvolio

Education

University of Milano Bicocca *Milan (MI), Italy*

M.S. in Computer Science (grade: 110/110 cum laude) *Sept. 2021 - March 2024*

- Thesis title: *Self-Supervised Learning And Model Adaptation For Facial Attribute Classification*.
- Keywords: Facial Attribute Classification, MAAD-Face Dataset, CelebA Dataset, Self-Supervised Learning, DINOv2, Low-Rank Adaptation (LoRA), Parameter-efficient Model Adaptation for Vision Transformers (PEViT), Dataset Quantization (DQ).

University of Calabria *Arcavacata (CS), Italy*

B.S. in Computer Science (grade: 108/110) *Sept. 2018 - Sept. 2021*

- Thesis title: *From Vision to Action: Full-Stack Automated Reasoning Modules*
- Keywords: Answer Set Programming (ASP), vision module, knowledge representation

Skills

Programming Languages	Python, Java, C++, C, MATLAB, Perl
Natural Language Processing	Multilingual Named-Entity Recognition (CRFs, neural extensions), Topic Extraction (LDA, Neural Topic Models), Question Answering (Retriever-Reader Architecture), Text Classification & Sentiment Analysis, Text Summarization, Text Generation
Robot Localization & Mapping	Bayesian filtering (Gaussian Filters, Nonparametric Filters), Robot Motion & Perception, SLAM (EKF, FAST, GRAPH)
Computer Vision	Adaptive algorithms (contrast, noise reduction, artifact removal), Image quality assessment, Object/image recognition and classification (traditional and deep learning), Indexing and retrieval in multimedia systems
Frameworks/Libraries	TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, Matplotlib, Pandas, Numpy, Seaborn, Hugging Face Transformers, Haystack, Plotly
Answer Set Programming	DLV2
Optimization	LINGO, OPL-CPLEX
Technologies/Tools	Linux, Git, GNU tools, MPI, OpenMP, Android Studio, Unity3D, Jupyter Notebooks
Virtualization	Docker, VirtualBox
Automation	GitLab CI/CD, GitHub Actions, Make, Maven, Gradle, CMake, systemd
Databases	MariaDB, SQLite, MySQL, PostgreSQL, MongoDB, SQL, Neo4J
Documentation	LaTeX, AsciiDoc, Markdown
Languages	English, Italian

Honors & Awards

Domestic Awards

July 2021 **Best Students 2020 Award**, Graduation Day — *University of Calabria*

Research Publications

From Vision to Execution: Enabling Knowledge Representation and Reasoning in Hybrid Intelligent Robots Playing Mobile Games *KR2023*

Co-Author *Rhodes, Greece | September 2-8, 2023*

- The paper explores the automation of interactions with touch surfaces, presenting a delta robot designed to engage in match-3 games and ball-sorting puzzles on mobile phones. This robot employs a vision module to identify objects by color and shape, and utilizes declarative models for decision-making based on game rules and strategies. By integrating AI techniques such as vision processing and answer set programming, the system simplifies motion control through its delta robot configuration. The authors detail the components of their robotic application, demonstrating its capabilities through implementations of various games. They suggest that this approach facilitates innovative combinations of knowledge representation and robotics, offering a controlled environment for experimenting with hybrid reasoning methods without the burden of technical implementation.
- Keywords: Applications of KR in robotics, Applications of KR Integrating symbolic and sub-symbolic approaches, KR related tools and systems.

An iterative abstraction and decision making pipeline for answer set programming in robots playing mobile games (submitted) *ICLP 2024*

Co-Author *Dallas, Texas | 11-17 October, 2024*

- Keywords: Applications of KR in robotics Applications of KR Integrating symbolic and sub-symbolic approaches KR related tools and systems.