DESCRIPTION
Research in the area of Machine Intelligence aims at developing and studying computational and mathematical models, algorithms, theories, and paradigms for analyzing, understanding, and modeling data, or more generally, reasoning about them. Key methodologies span across different interdisciplinary fields, such as artificial intelligence, symbolic computation, machine learning, signal and image processing, computer vision, and computer graphics. In more detail, in artificial intelligence topics of interest include knowledge representation and reasoning, intelligent agents and multi-agent systems, theorem proving and model building, as well as search methodologies, with emphasis on discrete space search. In machine learning main methods and approaches relate to graphical models, statistical learning and kernel theories, and multiclassifier methods for classification and clustering. In multi-dimensional signal processing the studied techniques regard advanced filtering, feature extraction and segmentation methods, multiresolution and sparse signal representations, time(spatial)/scale methods, including wavelets, compressive sensing, large scale image characterization and retrieval tools, related to both optical and multimodal images. Computer vision mainly exploits geometric and probabilistic approaches for 3D reconstruction, object recognition, dynamic scene analysis and understanding. Computer graphics relates geometric/physically-based theories for object modeling, shape analysis and visualization.

LABORATORIES
ARlette: Automated reasoning - artificial intelligence, symbolic computation, computational logic.
K.Re.Art.I: Representing knowledge using Artificial Intelligence.
VIPS: Vision Image Processing and Sound.

PROJECTS (2012-2016)
- Scan4Reco Horizon 2020 REFLECTIVE-7-2014, Grant Agreement No: 665091 Advanced 3D modelling for accessing and understanding European cultural assets. The project aims at developing methods for multimodal scanning of artworks and modelling of materials ageing.
- H2020 european project under the Innovative Training Networks H2020-MSCA-ITN-2015 call "Time-lapse understanding of the static and human scene and its lighting" (SceneUnderLight), (EU project 676455).
- COST, European Concerted Research Action "Rich-model toolkit: an infrastructure for reliable computer systems" (IC0901) 10/2009 - 10/2013. http://richmodels.epfl.ch/. The rich model toolkit initiative explores directions and techniques for making automated reasoning (including analysis and synthesis) applicable to a wider range of problems, as well as making them easier to use by researchers, software developers, hardware designers, and information system users and developers.
- 2013 PRIN Security Horizons. This project aims at developing a rigorous methodology and a language-based framework that will provide formal methods to support software engineers when they design, implement and maintain secure systems.
SELECTED PUBLICATIONS (2012-2016)


- F. Cicalese, E. Sany Laber, A. Medeiros Soeuffler. Diagnosis determination: decision trees optimizing simultaneously worst and expected testing cost. ICML 2014: 414-422


PEOPLE (2017)

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