Salvatore Giugliano

Year end presentation

Tutor: Roberto Prevete
co-Tutor: Francesco Isgrò

Cycle: XXXV   Year: First

My background

- Master Degree (cum laude) in Computer Science at Università degli Studi di Napoli "Federico II"
  - Thesis: "Activation functions for deep neural networks: a theoretical and experimental analysis "

- Research laboratory
  - Artificial Intelligence, Privacy & Applications (AIPA) Lab

  - Augmented Reality for Health Monitoring Laboratory (ARHeMLab)


- Scholarship type
  - No scholarship

Research activity: overview

- **Graph Convolutional Neural Networks (GCNN)**
  - Data in a Non-Euclidean domain
  - Redefine convolution operations on Graph Neural Networks
  - Spatial and Spectral approaches

- **eXplainable Artificial Intelligence (XAI)**
  - Explanations of the model's output that can be easily interpreted by the human beings
  - Black-box or white-box methods
  - low-level or middle-level feature approaches
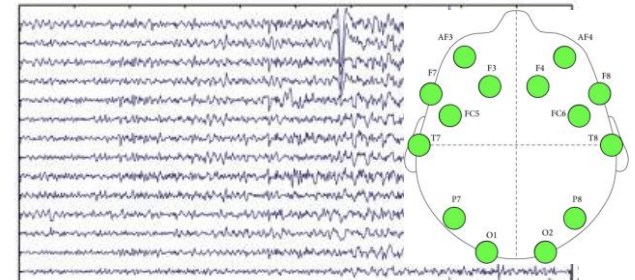
Research activity: GCNN
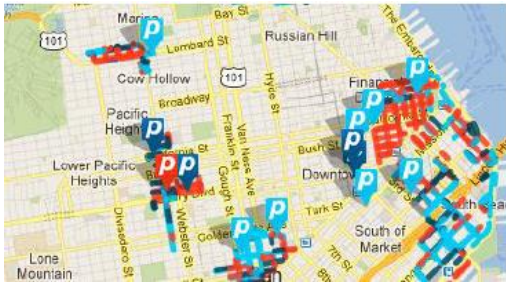
1. **Parking prediction**
   - San Francisco Park Dataset
   - Road network

2. **Engagement classification**
   - AVATEA Dataset
   - EEG on multi channels

Spatial and Temporal Features

Standard Machine Learning methods

Research activity: GCNN

1. **Parking prediction**
   – San Francisco Park Dataset
   – Road network

2. **Engagement classification**
   – AVATEA Dataset
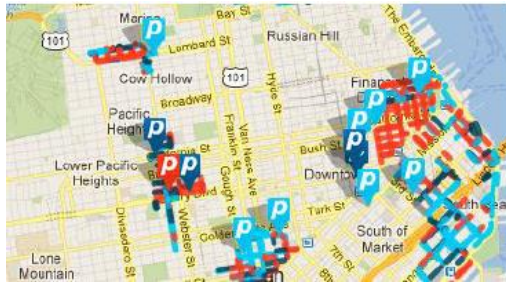   – EEG on multi channels

Spatial and Temporal Features

Graph Representation

Graph Convolution

Graph Convolutional Neural Network
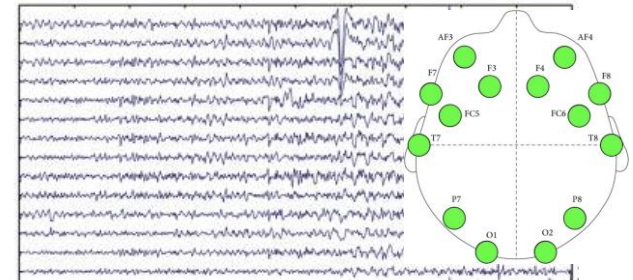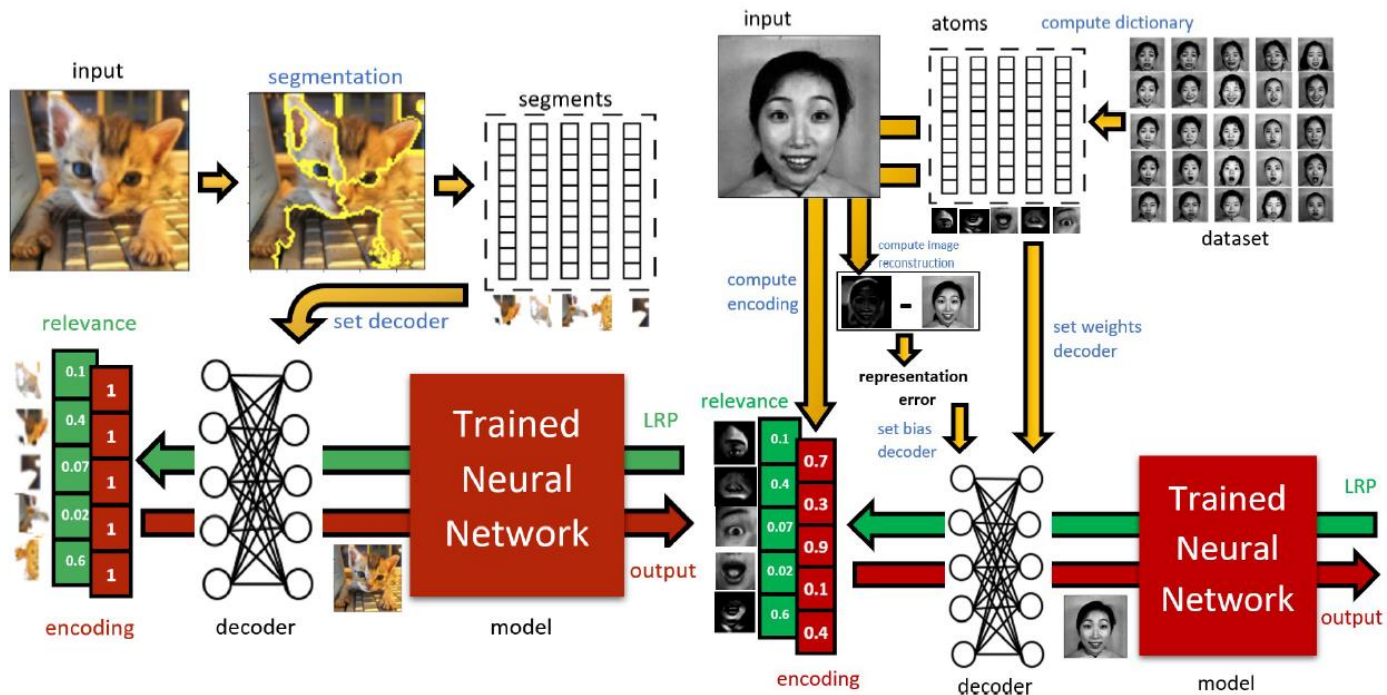
Research activity: XAI

"A general approach to compute the relevance of middle-level input features"
- White-box method
- Middle-level features approach
- Several different representations of middle-level features

Products

Conference paper submitted:

- "**A general approach to compute the relevance of middle-level input features**", Andrea Apicella, Salvatore Giugliano, Francesco Isgro and Roberto Prevete, ICPR Workshop on Explainable Deep Learning-AI, EDL-AI 2020

Papers in preparation:

- "**Engagement classification in a pediatric rehabilitation environment**", Andrea Apicella, Pasquale Arpaia, Mirco Frosolone, Salvatore Giugliano, Francesco Isgrò, Giovanna Mastrati, Nicola Moccaldi and Roberto Prevete.

- "**Measurement of engagement in a pedagogical teaching environment**", Andrea Apicella, Pasquale Arpaia, Mirco Frosolone, Salvatore Giugliano, Francesco Isgrò, Giovanna Mastrati, Nicola Moccaldi and Roberto Prevete.

Summary of study activities

Ad hoc PhD courses of the last year

- Accelerated Computing With Cuda C/C++
- Intelligenza Artificiale ed Etica
- Deep Learning for Computer Vision
- Matlab Fundamentals
- Scientific Programming and Visualization with Python
- Machine Learning 4 Health

	Courses	Seminars	Research	Tutorship	Total
Bimonth 1	2.3	0.2	7.5		10
Bimonth 2			8		8
Bimonth 3	4	0.8	6		10.8
Bimonth 4	13	5.1	7		25.1
Bimonth 5	4	0.8	4		8.8
Bimonth 6			8		8
Total	23.3	6.9	40.5		70.7
Expected	20	5	35	0	60