Michele Svanera

Ph.D.

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Research Interests

I obtained my Bachelor and Master degrees working on Signal Processing, Computer Vision, and Machine Learning, and since the second year of my PhD I have become increasingly interested in neuroscience, thanks to multiple collaborations with different Brain centres (Maastricht and Tel Aviv). Wandering across Cognitive Neuroscience and Artificial Intelligence (specifically deep learning), I address the goal of understanding the brain activities in relation with movie stimulus applying recent advances in machine learning. I joined prof. Lars Muckli's lab in May 2017, as postdoctoral researcher, to extend my studies to high-field fMRI and non-feedforward sources location in primary visual cortex.

Education

In Progress

2017 – 2019

Research Associate, *Department of Neuroscience and Psychology*, University of Glasgow, Scotland.

Human Brain Project (EU funding), with prof. Lars Muckli (PI), working on "Generative deep learning for fMRI feedbacks modelling" and "Functional connectivity organisation elicited by the vision of occluded movie".

Completed

2014 – 2017

Ph.D. student, Department of Information Engineering, University of Brescia (Italy) with Sergio Benini, Ph.D.. Covered fields: Signal processing, Machine learning, Computer vision and fMRI data analysis. Thesis title: *Movies and the brain: learning video content representation for cinema studies and neuroscience* (defense 09/05/2017).

International experiences

Visiting PhD	*Functional Brain Center, Sourasky center, Tel Aviv (Israel): 3 months of collaboration with prof. Talma Hendler on Deep Learning approaches for fMRI analysis. (2016)*
Visiting PhD	*Maastricht Brain Imaging Centre, Maastricht (Netherlands): 5 months of collaboration with prof. Rainer Goebel on Audio-visual features reconstruction based on fMRI signal. (2015)*
Summer school	*International Computer Vision Summer School, Sicily (Italy): Deep learning. Speakers: Yoshua Bengio, Fei-Fei Li, Stefano Soatto, Andrea Vedaldi, Matthew Zeiler. (2015)*

Teaching assistant

Fundamentals of computer graphics (master course, '14 -'15 -'16).
Digital image processing (master course, '14).

2011 – 2013

Master of Science (M.Sc. Eng.),
Telecommunication Engineering, University of Brescia, Italy.

Master thesis: Methods and models for the synthesis and representation of 3D surfaces.

2006–2011

Bachelor of Science (B.Sc. Eng.),
Electronic Engineering, University of Brescia, Italy.
Bachelor thesis: Development of eye tracking technique.

Journal Publications

2019 Bálint, K.A., Gal Raz, Valente G, **M. Svanera**, and S. Benini. "A Robust Neural Fingerprint of Cinematic Shot-Scale". In: *Projections* 13.3, pp. 23 –52. DOI: 10.3167/proj.2019.130303.

2019 Bontempi, D., S. Benini, A. Signoroni, **M. Svanera***, and L. Muckli*. "CEREBRuM: a fast and fully-volumetric Convolutional Encoder-decodeR for weakly-supervised sEgmentation of BRain strUctures from out-of-the-scanner MRI". In: *Medical Image Analysis (under revision)*.

2019 Raz, G., G. Valente, **M. Svanera**, S. Benini, and K.A. Bálint. "Shot Scales in the Brain: A Robust Neural Fingerprint of Perceiving Apparent Distance in Movies". In: *Projections, The Journal for Movies and Mind (accepted)*.

2019 **Svanera M.**, S. Benini, G. Raz, T. Hendler, R. Goebel, and G. Valente. "Transfer learning of deep neural network representations for fMRI decoding". In: *Journal of Neuroscience Methods*. DOI: 10.1016/j.jneumeth.2019.108319.

2019 **Svanera M.**, A. T. Morgan, L. S. Petro, and L. Muckli. "An unsupervised deep neural network resembles early visual cortex fMRI activity patterns when filling occluded scenes". In: *Frontiers in Neuroscience (under revision)*.

2019 **Svanera M.**, M. Savardi, A. Signoroni, K.A. Bálint, and S. Benini. "Who is the film's director? Automatic style recognition based on shot features". In: *IEEE MultiMedia Magazine*. DOI: 10.1109/MMUL.2019.2940004.

2018 Muhammad, U. R., **M. Svanera**, R. Leonardi, and S. Benini. "Hair detection, segmentation, and hairstyle classification in the wild". In: *Image and Vision Computing* 71, pp. 25 –37. DOI: 10.1016/j.imavis.2018.02.001.

2017 Raz, G., **M. Svanera**, N. Singer, G. Gilam, M. B. Cohen, T. Lin, R. Admon, T. Gonen, A. Thaler, R. Y. Granot, R. Goebel, S. Benini, and G. Valente. "Robust inter-subject audiovisual decoding in functional magnetic resonance imaging using high-dimensional regression". In: *NeuroImage*. DOI: 10.1016/j.neuroimage.2017.09.032.

2016 Benini, S., **M. Svanera**, N. Adami, R. Leonardi, and K.A. Bálint. "Shot Scale Distribution in Art Films". In: *Multimedia Tools and Applications*. DOI: 10.1007/s11042-016-3339-9.

2016

Gordiychuk, A., **M. Svanera**, S. Benini, and P. Poesio. "Size distribution of micro bubbles for a venturi type bubble generator: effect of different parameters on bubble mean size , statistics of the distribution". In: *Experimental Thermal and Fluid Science*. DOI: 10.1016/j.expthermflusci.2015.08.014.

Conference Publications

2018

Svanera M., A. T. Morgan, L. S. Petro, and L. Muckli. "Unsupervised deep neural network for fMRI feedback modelling". In: *2018 Conference on Cognitive Computational Neuroscience (CCN)*. URL: https://ccneuro.org/2018/proceedings/1055.pdf.

2016

Svanera M., S. Benini, G. Raz, T. Hendler, R. Goebel, and G. Valente. "Deep driven fMRI decoding of visual categories". In: *NIPS Workshop on Representation Learning in Artificial and Biological Neural Networks (MLINI, 2016)*. URL: https://arxiv.org/abs/1701.02133.

2016

Svanera M., U. Riaz Muhammad, R. Leonardi, and S. Benini. "Figaro, hair detection and segmentation in the wild". In: *Proceedings of IEEE International Conference on Image Processing (ICIP, 2016)*. DOI: 10.1109/ICIP.2016.7532494.

2015

Svanera M., S. Benini, N. Adami, R. Leonardi, and K.A. Bálint. "Over-the-Shoulder Shot Detection in Art Films". In: *13th International Workshop on Content-Based Multimedia Indexing (CBMI, 2015)*. DOI: 10.1109/CBMI.2015.7153627.

Certifications

- Deep Learning Specialization (all five courses, coursera.org)
- Machine Learning (Stanford, coursera.org)
- Networked Life (University of Pennsylvania, coursera.org)
- Social Network Analysis (University of Michigan, coursera.org)
- Process Mining: Data science in Action (Eindhoven University of Technology, coursera.org)
- Statistical Analysis of fMRI Data (Johns Hopkins University, coursera.org)
- Mining Massive Datasets (Stanford University, coursera.org)
- Applied Regression Analysis (Ohio State University, coursera.org)
- Applied Logistic Regression (Ohio State University, coursera.org)

Languages

Italian	Native	*Mother Tongue*
English	Fluent	

Skills

Development

Languages	C, C++, Java	**Databases**	MySQL
Script	Python, Shell	**Web**	PHP, HTML, CSS
Tools	Matlab, LaTex, Gnuplot, Github		

OS experience

GNU/Linux ★★★★☆

MacOS ★★★★★

Windows ★★★☆☆

Interests

Hobby — Reading, cooking, PC strategy games, walking, and homebrewing.

Sport — Football, swimming, running, cycling, yoga, muay thai, squash, and bouldering. And of course sleeping, because after all of these sports!

References

Post-doc PI

Prof. Lars Muckli
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Ph.D. Advisor

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University of Brescia
Italy
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Collaborators

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Department of Cognitive Neuroscience
Maastricht University
The Netherlands
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Gal Raz, Ph.D.
The Tel Aviv Center for Brain Functions
Tel Aviv Sourasky Medical Center
Israel
✉ galrraazz@gmail.com