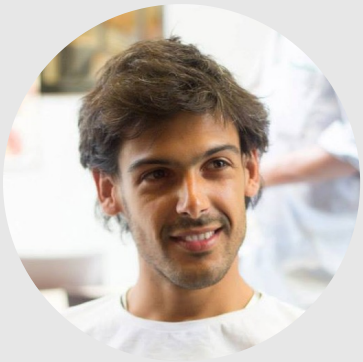

Nino Cauli

Postdoctoral researcher

17 November 1984

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Skills

General skills:

- Machine learning
- Computer Vision
- Control
- Agile software development methods

Technical skills:

- Programming languages (C, C++, Matlab, Python)
- Deep learning frameworks (PyTorch, Tensorflow)
- Robotics middlewares (ROS, YARP)
- Robotics Simulators (Gazebo and iCub Simulator)
- Computer Vision libraries (OpenCV)
- Game engines (Unreal Engine 4)
- Humanoid robots: (iCub, Sabian, Vizzy)

The skill scale is from 0 (Fundamental Awareness) to 6 (Expert).

Academic positions

Dec 2018- Postdoctoral researcher — Ryerson Multimedia Research Laboratory, Toronto
He is creating novel vision-based 3D object recognition and pose estimation algorithms utilizing recent developments in deep learning.

2016-2018 Postdoctoral researcher — VisLab, ISR, Instituto Superior Técnico (IST), Lisbon
He developed deep neural network systems to control robots based on camera images.

2014-2015 Postdoctoral researcher — BioRobotics Institute, SSSA, Pisa
He was involved in the subproject "SP10 - Neurorobotics platform" of the Human Brain Project (HBP), contributing to develop the closed loop engine of a neurorobotic simulator.

VisLab, ISR, IST, Lisbon
Bringing on research studies on sensory prediction and anticipation on humanoid robots

2013 Visiting researcher — VisLab, ISR, IST, Lisbon
He developed an expected perception-based control for reaching a moving target

Education

2010-2014 Ph.D. Degree in Biorobotics cum laude — BioRobotics Institute, SSSA, Pisa
Title of the graduation thesis: "Modelling and implementation of sensory-motor anticipation: Internal Models and Expected Perception for humanoid robot".

2007-2010 M.Sc. in Computer Science (110/110) — University of Pisa, Italy
Title of the graduation thesis: "Study and implementation of a neural networks based system to calculate the Expected Perception of the optical flow".

2003-2007 B.Sc. in Computer Science — University of Cagliari, Italy
Title of the graduation thesis: "Gestures controlled virtual navigation".

2006 Visiting Student — Visual Computing Lab, CRS4, Pula, Italy
He developed a 3D navigation control system based on hand gestures.

Projects involvement

2016 Augmented Human Assistance (AHA) — CMU-Portugal
(CMUP-ERI/HCI/0046/2013)
Contribution to the implementation of a full body gesture recognition system based on Microsoft Kinect2 sensor.

2014-2015 Human Brain Project (HBP) — H2020 FET Flagship Project
Contribution to the implementation of the closed loop engine of a neurorobotic simulator in the subproject "SP10 - Neurorobotics platform".

2009-2013 RoboSoM "A robotic Sense of Movement" — European Commission
(ICT-2009.2.1/248366)
Contribution to the implementation of a sensory based predictive control system.

Awards

2018 Best paper award
at IEEE International Conference on Autonomous Robot Systems and Competitions (ICARSC) 2018 with the paper: "iCub, clean the table!" A robot learning from demonstration approach using Deep Neural Networks.

Grants

since 2018 Postdoctoral research grant
Ryerson University, Toronto, Canada

2016-2018 Postdoctoral research grant
IST-ID, Lisbon, Portugal

2014-2015 Postdoctoral research grant
BioRoboticsInstitute,SSSA,Pisa

2010-2013 Ph.D. scholarship
Scuola Superiore Sant'Anna, Pisa, Italy

Languages

Italian (native)

English (fluent)

Portuguese (fluent)

Personal interests

Flight:

2018 EASA PPL licence
+/- 70 flight hours on a Cessna 150/152

2013 Ultralight aircraft Italian licence
+/- 40 flight hours on a Tecnam p92

Sports:

since 2013 Capoeira (Graduado)

1990-2000 Artistic skating

Windsurf

Musical instruments:

Mandolin and guitar

Publications

Journal papers

[1] E. Falotico, L. Vannucci, A. Ambrosano, U. Albanese, S. Ulbrich, J. C. Vasquez Tieck, G. Hinkel, J. Kaiser, I. Peric, O. Denninger, N. Cauli, *et al.*, "Connecting artificial brains to robots in a comprehensive simulation framework: The neurorobotics platform," *Frontiers in neurorobotics*, vol. 11, p. 2, 2017.

[2] G. Hinkel, H. Groenda, S. Krach, L. Vannucci, O. Denninger, N. Cauli, S. Ulbrich, A. Roennau, E. Falotico, M.-O. Gewaltig, *et al.*, "A framework for coupled simulations of robots and spiking neuronal networks," *Journal of Intelligent & Robotic Systems*, vol. 85, no. 1, pp. 71–91, 2017.

[3] E. Falotico, N. Cauli, P. Kryczka, K. Hashimoto, A. Berthoz, A. Takanishi, P. Dario, and C. Laschi, "Head stabilization in a humanoid robot: models and implementations," *Autonomous Robots*, vol. 41, no. 2, pp. 349–365, 2017.

[4] N. Cauli, E. Falotico, A. Bernardino, J. Santos-Victor, and C. Laschi, "Correcting for changes: expected perception-based control for reaching a moving target," *IEEE Robotics & Automation Magazine*, vol. 23, no. 1, pp. 63–70, 2016.

Conference papers

[5] N. Cauli, P. Vicente, J. Kim, B. Damas, A. Bernardino, F. Cavallo, and J. Santos-Victor, "Autonomous table-cleaning from kinesthetic demonstrations using Deep Learning," in *Joint IEEE International Conference on Development and Learning (ICDL) and Epigenetic Robotics (EpiRob)*, IEEE, 2018.

[6] J. Kim, N. Cauli, P. Vicente, B. Damas, F. Cavallo, and J. Santos-Victor, ""iCub, clean the table!" A robot learning from demonstration approach using deep neural networks," in *Autonomous Robot Systems and Competitions (ICARSC), 2018 IEEE International Conference on*, pp. 3–9, IEEE, 2018.

[7] L. Vannucci, A. Ambrosano, N. Cauli, U. Albanese, E. Falotico, S. Ulbrich, L. Pfotzer, G. Hinkel, O. Denninger, D. Peppicelli, *et al.*, "A visual tracking model implemented on the iCub robot as a use case for a novel neurorobotic toolkit integrating brain and physics simulation.," in *Humanoids*, pp. 1179–1184, 2015.

[8] G. Hinkel, H. Groenda, L. Vannucci, O. Denninger, N. Cauli, and S. Ulbrich, "A Domain-Specific Language (DSL) for Integrating Neuronal Networks in Robot Control. In 2015 Joint MORSE," in *VAO Workshop on Model-Driven Robot Software Engineering and View-based Software-Engineering*, 2015.

[9] L. Vannucci, N. Cauli, E. Falotico, A. Bernardino, and C. Laschi, "Adaptive visual pursuit involving eye-head coordination and prediction of the target motion," in *Proceedings of the 14th IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, pp. 541–546, 2014.

[10] N. Cauli, E. Falotico, A. Bernardino, J. Santos-Victor, and C. Laschi, "A robotic implementation of a reaching model based an a bio-inspired sensory anticipation system: the Expected Perception," in *IV Congresso Gruppo Nazionale Bioingegneria (GNB)*, 2014.

[11] E. Falotico, N. Cauli, K. Hashimoto, P. Kryczka, A. Takanishi, P. Dario, A. Berthoz, and C. Laschi, "Head stabilization based on a feedback error learning in a humanoid robot," in *RO-MAN, 2012 IEEE*, pp. 449–454, IEEE, 2012.

[12] N. Moutinho, N. Cauli, E. Falotico, R. Ferreira, J. Gaspar, A. Bernardino, J. Santos-Victor, P. Dario, and C. Laschi, "An expected perception architecture using visual 3d reconstruction for a humanoid robot," in *Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on*, pp. 4826–4831, IEEE, 2011.

Under review papers

[13] J. Kim, N. Cauli, P. Vicente, B. Damas, A. Bernardino, J. Santos-Victor, and F. Cavallo, "Cleaning tasks knowledge transfer between heterogeneous robots: a deep learning approach," *Journal of Intelligent & Robotic Systems*, 2018.

Teaching Activities

2019 — Laboratory teaching assistant — Ryerson University, Toronto
in the course of "Basics of Multimedia Systems" at the Department of Electrical and Computer Engineering.

2018 — Co-supervisor M.Sc. thesis — VisLab, ISR, IST, Lisbon
on autonomous UAV navigation using vision and deep reinforcement learning.

2017-2018 — Co-supervisor M.Sc. thesis — VisLab, ISR, IST, Lisbon
on UAV autonomous landing on a mobile base using vision.

2017-2018 — Help in supervising Ph.D. thesis — VisLab, ISR, IST, Lisbon
on learning from demonstration how to clean a table using deep neural networks.

2013 — Laboratory assistant — University of Pisa, Italy
in the M.Sc. course of "Robotic Perception" at the School of Computer Science.