Andrea Baisero

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Personal Profile

Nationality Italian

Date of Birth 04 July 1988

I am an aspiring researcher in the field of machine learning. My research interests focalise on stochastic models for pattern recognition, reinforcement learning, representation learning, symbol learning and models for joint logic-geometric knowledge, with applications in general-purpose robotics, context-aware autonomous systems, and human-robot interaction.

Professional Experience and Activities

Feb 2013 → Ongoing **Research Engineer**, *Machine Learning and Robotics Lab (MLR)*, University of Stuttgart, Germany.

- Detection of human-object and object-object *interaction phases* during sequential assembly task demonstrations, with extraction of assembly task representation.
- Encoding/decoding object identities into/from vision-based context-dependent human-like symbolic descriptions, and evaluation by means of user studies.
- Logic-geometric knowledge sharing. Developed Bayesian model for the inference of object features/geometry conditional to relational symbolic descriptions.

Feb 2013 → Ongoing **Teaching Assistant**, *Machine Learning and Robotics Lab (MLR)*, University of Stuttgart, Germany.

- Teaching responsibilities in machine learning, seminar course in machine learning, mathematics for intelligent systems, optimization, and artificial intelligence.
- Supervision of Bachelor and Master theses, and of undergraduate student research assistants.

Sep 2012 → Dec 2012 **Research Engineer**, *Computer Vision and Active Perception Lab (CVAP)*, Royal Institute of Technology (KTH), Sweden.

- Refinement of theoretical and experimental aspects of the Master thesis project.

Education

Feb 2013 → Ongoing **PhD in Machine Learning**, *ongoing*,
Machine Learning and Robotics Lab (MLR), IPVS
University of Stuttgart, Germany.
Supervision by Prof. Marc Toussaint.

Apr 2014 **Machine Learning Summer School**,
Reykjavik University, Iceland.
10-day summer school with focus on fundamental and advanced methods of machine learning, data analysis, and inference, from theory to practice.
Colocated with AISTATS 2014.

Aug 2010 → Oct 2012 **MSc in Engineering**,
Royal Institute of Technology (KTH), Sweden.
As a double-degree student from the *Polytechnic University of Turin*.

Sep 2009 → Nov 2012 **MSc in Computer Engineering**, *full marks (110/110) cum laude*,
Polytechnic University of Turin (PoliTo), Italy.

Sep 2006 → Oct 2009 **BSc in Computer Engineering**, *full marks (110/110) cum laude*, Polytechnic University of Turin (PoliTo), Italy.

Master Thesis

Title *Encoding Sequential Structures using Kernels – Path-Based Feature Space Embeddings for Sequential Data*

Supervision Dr. Carl H. Ek (Senior Researcher) and Dr. Florian T. Pokorny (Postdoctoral Researcher) of the Computer Vision and Active Perception Lab (CVAP), Royal Institute of Technology (KTH).

Description Development of a novel family of modular kernel functions for sequential data embedding. Results published as *The Path Kernel* at ICPRAM 2013.

Honours and Awards

2013 **AI Master Thesis Award**, *Swedish AI Society*.
Yearly national award for the best Master thesis in the area of artificial intelligence.

Knowledge and Skills

Mathematics Advanced understanding of linear algebra and probability theory, motivated by the desire of a solid formal theoretical foundation for machine learning and modeling.

Machine Learning Experienced with various machine learning methods, including standard regression and classification models, SVMs, GPs, NNs, latent variable and mixture models, HMMs, CRFs, factor graphs, bayesian inference, and MCMC.

Robotics Working experience with the PR2 robot and the ROS framework.

Programming Proficient in (in order of preference) Python, C/C++, Matlab/Octave, and Bash/Zsh. Coursework experience with Java, JavaScript, ActionScript, and Assembly x86.

Computer Competent with GNU/Linux, git, vim, and LaTeX.

Languages

Self assessment according to CEFR.

Italian **Native**

English **Proficient (C2) in understanding, speaking and writing.**

French **Independent (B2) in understanding and speaking. Basic (A2) in writing.**

German **Independent (B1) in understanding and speaking. Basic (A2) in writing.**

Swedish **Basic (A2) in understanding, speaking and writing.**

Misc. Info

Licences Driving Licence (B).

International Experience Life-long international experience gained by traveling the continents since early childhood, and living for long periods of time in cities including Mogadishu, Moscow, Venice, Johannesburg, Tunis, Paris, Turin, Stockholm and Stuttgart.

Languages Nurtural inclination towards language learning, having studied basics of widely diverse languages including Russian, Afrikaans and Arabic.

Hobbies and Interests Classic and modern board games, with a preference for strategic war abstractions such as Go, Backgammon or Shogi.

Publications

[1] A. Baisero, F. T. Pokorny, D. Kragic, and C. H. Ek. "The Path Kernel." In: *ICPRAM*. 2013, pp. 50–57. (*Selected to appear as a revised version under the title "The Path Kernel: A Novel Kernel for Sequential Data" in *Pattern Recognition Application and Methods, Springer*, 2015, pp. 71–84).

[2] A. Baisero, F. T. Pokorny, and C. H. Ek. "On a Family of Decomposable Kernels on Sequences". In: *arXiv preprint arXiv:1501.06284* (2015).

[3] A. Baisero, Y. Mollard, M. Lopes, M. Toussaint, and I. Luetkebohle. "Temporal segmentation of pair-wise interaction phases in sequential manipulation demonstrations". In: *Intelligent Robots and Systems (IROS), 2015 IEEE/RSJ International Conference on*. IEEE, 2015, pp. 478–484.

[4] Y. Mollard, T. Munzer, A. Baisero, M. Toussaint, and M. Lopes. "Robot programming from demonstration, feedback and transfer". In: *Intelligent Robots and Systems (IROS), 2015 IEEE/RSJ International Conference on*. IEEE, 2015, pp. 1825–1831.

[5] A. Baisero, S. Otte, P. Englert, and M. Toussaint. "Identification of Unmodeled Objects from Symbolic Descriptions". In: *arXiv:1701.06450 [cs, stat]* (Jan. 23, 2017). arXiv: 1701.06450.