

# Emanuele Sansone

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## Summary

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I'm a researcher in the field of machine learning. Previously, I was studying the use of unlabeled data to support decision making, in the form of semi-supervised, positive unlabeled and unsupervised learning. I'm currently interested in using data and machine learning to perform reasoning tasks, in particular to automate the process of theorem proving. I have excellent organizational, communication and presentation skills developed over different teaching and supervising experiences at university as teaching assistant and in sports as ski coach and ski master instructor.

## Education

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2013-2018	<p>Ph.D. <i>ICT doctoral school, University of Trento, Italy</i> Thesis: <a href="#">"Towards Uncovering the True Use of Unlabeled Data in Machine Learning"</a> Advisor: Prof. Francesco G.B. De Natale. Dissertation on the usage of unlabeled data in different areas of machine learning, including unsupervised, positive unlabeled and semi-supervised learning.</p>
2011-2012	<p>M.Sc. in Telecommunications Engineering (cum laude) University of Trento, Italy 110/110 <i>summa cum laude</i>   Gpa: 28.82/30 Thesis: "Multimodal Photo Galleries Synchronization" Advisor: Prof. Nicola Conci, Giulia Boato. Computer vision application for automatic synchronization of photo galleries from multiple users attending the same event (C++ language).</p>
2008-2010	<p>B.Sc. in Telecommunications Engineering University of Trento, Italy Thesis: "Master P-NET protocol implementation on PIC 32 architecture" Advisor: Prof. Dario Petri, Eng. Michele Corrà. Programming a master device in a network composed by different sensors and actuators. Implementation of P-NET protocol over a PIC 32 microcontroller (C language).</p>

## Work and Research Experience

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2018-2020	<p>Research Scientist <i>Huawei Technologies R&amp;D, London, UK</i> Doing research in the area of deep generative models and self-supervised learning. Writing white papers and patenting ideas. Supervising students on using machine learning for applications related to the company: Yinbai Li (Bachelor student in Mathematics at University of Cambridge), Xingyu Jin (Master student in Computer Science at University of Edinburgh).</p>
2018-to date	<p>Reviewer Serving as a reviewer for international journals in the area of machine learning and signal processing, such as IEEE Transactions on Neural Networks and Learning Systems, Machine Learning (Springer) and IEEE Transactions on Image Processing.</p>
2015-2016	<p>Research Internship <i>LAMDA group, Nanjing University, China</i> Advisor: Prof. Zhi-Hua Zhou. Working on positive unlabeled learning and participating in reading groups.</p>

## Academic Experience

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2016	<p>Teaching Assistant, Computer Vision (Code 140266)</p> <p><i>M.Sc. in Telecommunications Engineering, University of Trento, Italy</i></p> <p>Goal: provide an introductory view of machine learning and neural networks. <a href="#">[Sample Material]</a></p> <p>Tasks (frontal lessons): Basic notions of statistical learning theory. Introduction to neural networks and derivation of the backpropagation algorithm. Building a binary classifier with neural networks (with demo in Matlab). Extending the classifier to multiclass classification (with demo in Matlab).</p> <p>Tasks (lab sessions for the main course): Introduction to OpenCV and explanation/ implementation of SIFT descriptors.</p> <p>Case study/Project description: design and implementation of a neural network classifier for positive unlabeled learning.</p> <p>Students' supervision and Assessment: Federico Morelli, Davide Piscini, Subhankar Roy, Alessandro Antonucci, Pietro Postal, Andrea Simonelli, Stefano Leornardelli, Giulio Carlo Gialanella, Davide Zanetti, Adriano Tomasi.</p>
2015	<p>Teaching Assistant, Multimedia Networking (Code 140151)</p> <p><i>M.Sc. in Telecommunications Engineering, University of Trento, Italy</i></p> <p>Goal: provide an introductory view of video compression/coding. <a href="#">[Sample Material]</a></p> <p>Tasks (frontal lessons): Introduction to motion estimation and problem formulation. Implementation of motion estimation algorithms (e.g. exhaustive search, 3-step search) and testing on synthetic datasets using Matlab. Analysis of computational complexity of the proposed motion estimation algorithms. Implementation and testing on real world data using Matlab. Review of fundamentals of video coding (which was covered in the main course). Summary of the comparison among different standards (i.e. H.261, MPEG-1, MPEG-2). Introduction and use of ffmpeg libraries with different configuration settings. Review of H.264 standard. Introduction and use of the H.264/AVC JM reference software manual.</p> <p>Project description: design and implementation of an algorithm for summarization of consumer videos.</p> <p>Student Supervision and Assessment: Michele Vascotto</p>

## Publications

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2020	<p><a href="#">Coulomb Autoencoders</a></p> <p>E. Sansone, H. T. Ali, J. Sun</p> <p>To appear in European Conference on Artificial Intelligence (ECAI)</p>
2018	<p><a href="#">Towards Uncovering the True Use of Unlabeled Data in Machine Learning</a></p> <p>E. Sansone</p> <p>PhD Thesis</p>
2018	<p><a href="#">Efficient Training for Positive Unlabeled Learning</a></p> <p>E. Sansone, F.G.B De Natale, Z.H. Zhou</p> <p>IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), <a href="#">[Code]</a></p>
2017	<p><a href="#">Training Feedforward Neural Networks with Standard Logistic Activations is Feasible</a></p> <p>E. Sansone, F.G.B. De Natale</p> <p>arXiv pre-print</p>
2017	<p><a href="#">Automatic Synchronization of Multi-User Photo Galleries</a></p> <p>E. Sansone, K. Apostolidis, N. Conci, G. Boato, V. Mezaris, F.G.B. De Natale</p> <p>IEEE Transactions on Multimedia (TMM), <a href="#">[Code]</a></p>
2016	<p><a href="#">Clastering: Joint Classification and Clustering with Mixture of Factor Analysers</a></p> <p>E. Sansone, A. Passerini, F.G.B. De Natale</p> <p>European Conference on Artificial Intelligence (ECAI), <a href="#">[Code]</a></p>
2014	<p><a href="#">Synchronizing Multi-User Photo Galleries with MRF</a></p> <p>E. Sansone, G. Boato, MS. Dao</p> <p>MediaEval Workshop</p>

2013	<a href="#">Event Clustering and Classification from Social Media: Watershed-based and Kernel Methods</a> TV. Nguyen, MS. Dao, R. Mattivi, E. Sansone, F.G.B. De Natale, G. Boato MediaEval Workshop
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## Invited Talks

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2019	<a href="#">Coulomb Autoencoders</a> Symposium on Deep Generative Models, British Computer Society (London, UK)
2017	<a href="#">Generative Adversarial Networks</a> Fondazione Bruno Kessler (Trento, Italy)

## Awards

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2016	Academic Hardware Grant Award, NVIDIA Award consisting of a NVIDIA Titan X GPU Description: Independently writing a proposal for <a href="#">research grant</a>
2012	Merit Award, University of Trento <i>Trento, Italy</i> Award assigned to distinguished master students

## Learning Certificates

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2020	Algorithms Specialization Certificate of completion Organization: <a href="#">Coursera (Stanford University)</a>
2018	Full Stack Deep Learning Bootcamp <i>Berkeley, USA</i> Certificate of completion Organization: <a href="#">University of California, Berkeley</a>
2017	Neural Networks for Machine Learning Certificate of completion Organization: <a href="#">Coursera (University of Toronto)</a>
2015	Machine Learning Summer School <i>Austin, USA</i> Certificate of completion Organization: <a href="#">University of Texas at Austin</a>

## Sport Professional Experience

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2011-to date	<p>Ski master instructor</p> <p><i>Italy</i></p> <p>This is the highest professional degree in alpine skiing (<a href="#">the total number of ski master instructors in Italy is around 200</a>), which can be achieved by demonstrating excellent skiing capabilities as well as strong organizational, didactical and methodological skills used in teaching.</p> <p>I hold several professional education and training courses for ski instructors and candidate ski instructors. The following is a list of people I prepared to become ski instructors: Alessandro Berlanda, Camilla Berlanda, Martina Kerschbaumer, Davide Raineri, Valentina Zampedri, Erman Baldessari, Federico Tonezzer, Martina Longobardi, Chiara Villotti, Stefano Gonzo, Francesca Cella, Samuel Piffer, Teo Valle, Martino Santoni, Emma Santoni, Thomas Corradino, Silvia Zeni, Marco Faccenda.</p>
2007-2017	<p>Ski coach</p> <p><i>Italy</i></p> <p>Coach of young athletes (6-20 years old) in several racing ski teams: Ski Team Sopramonte (2007/2008), Sci Club Padova (2008/2009), Sci Club Panarotta (2009-2011), Ski Team Paganella (2013/2014), Campiglio Ski Team (2016/2017).</p>
2002-2007	<p>Ski athlete</p> <p><i>Italy</i></p> <p>Participating in many international competitions. See a <a href="#">sample list of records</a>.</p>

## Sport Certificates

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2011	<p>Ski Master Instructor</p> <p><i>Milan, Italy</i></p> <p>Certificate</p> <p>Organization: <a href="#">FISI</a>, <a href="#">CoScuMa</a></p>
2011	<p>Ski Coach (3° level)</p> <p><i>Milan, Italy</i></p> <p>Certificate</p> <p>Organization: <a href="#">FISI</a>, <a href="#">STF</a></p>
2007	<p>Ski Instructor</p> <p><i>Trento, Italy</i></p> <p>Certificate</p> <p>Organization: <a href="#">PAT</a></p>

## Languages

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Italian:	Mothertongue
English:	Fluent (C2)
German:	Fluent (B2)

## Other Interests

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Blogging	Recently, I've discovered blogging as a way to share thoughts and notes about topics in machine learning.
Volunteering	From 2012 to 2014, I've been member of a no-profit association, <a href="#">GiPro</a> , composed by young representatives of different sectors (e.g. ski instructors, engineers, lawyers, psychologists). The goal of the association is to promote the professional categories on the territory and stimulate the inter-professional collaboration of young people.
Others	I like playing soccer and hiking.