

Francesco Setti

curriculum vitae

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Francesco Setti is currently a Post-Doc Research Fellow at the Department of Computer Science of the University of Verona working on the integration of logical and sociological methods and formalisms into computer vision and pattern recognition algorithms. Previously he was a Post-Doc Research Fellow at the Laboratory for Applied Ontology (LOA) of the Institute of Cognitive Science and Technologies (ISTC) of the Italian National Research Council (CNR) in Trento, working for the VISCOsO project, funded by the Autonomous Province of Trento through the Team 2011 funding programme; and earlier he was a Post-Doc Research Fellow, running the individual PAT-EU Cofund Marie Curie Action project ABILE at the Measurement Instrumentation and Robotics Group of the University of Trento.

He has a strong background in Computer Vision, Pattern Recognition, Machine Learning and Mechatronics; he graduated in Mechatronics Engineering at the University of Trento and he took the PhD in Mechanical Measurement Science at the University of Padua. During his career he spent 3 months at Instituto Superior Tecnico in Lisbon working with Dr. Alessio Del Bue, and 1 year at Queen Mary University of London under the supervision of Prof. Lourdes de Agapito. He is co-author of 7 journal papers and more than 15 papers in international peer-reviewed conferences. He has been in the Organizing Committee of CONTACT workshop @ECCV2014 and in the Program Committee of GROW workshop @CVPR2015 and CVSport workshop @ICCV2015 and @CVPR2017. He also serves as reviewer for top ranked journals and conferences like Neurocomputing, CVIU and ACM Multimedia.

He is co-founder of two start-up companies: one working on robotics and mechatronics (Robosense S.r.l.) and one on high-tech instrumentations for sports and fitness (Libon S.r.l.).

Research Interests

Currently, his main research focus is on integrating knowledge representation techniques and ontologies with computer vision and machine learning methods. In details, he focuses on three main topics:

Social Signal Processing: find groups of interacting people from still images by exploiting the sociological concept of F-formation and its formal definition

Ontology-driven Fine-Grained Visual Categorization: integrate prior knowledge into deep convolutional neural network architectures to boost fine-grained classification performances

Spectators Crowd Analysis: analyse the behaviour of a particular kind of crowd characterized by people who stands for most of the time and shares a common focus of attention (spectators of an entertainment event)

Higher Education

- 2007–2010 **Ph.D. in Science, Technologies and Measurements for Space**, *CISAS – University of Padua*, Padua – Italy.
Thesis: *Methods and applications of sensor fusion for mechatronic systems*, supervised by Prof. M. De Cecco
- 2005–2006 **M.S. in Mechatronics Engineering**, *University of Trento*, Trento – Italy.
Thesis: *Progettazione e sviluppo di un sistema basato su telecamera per la misura di posizione ed assetto relativi* (italian), supervised by Prof. M. De Cecco
- 2001–2005 **B.A. in Industrial Engineering**, *University of Trento*, Trento – Italy.
Thesis: *Analisi e simulazione del comportamento di un sistema ABS basato su controllore Sliding Mode* (italian), supervised by Prof. F. Biral

Research Experience

Professional History

- April 2017 – present **Post-Doc Research Fellow**, *Dept. of Computer Science*, University of Verona.
Research activity on detection, localization, tracking and fine-grained species recognition of birds in low resolution images – project **BCMS**
- June 2015 – March 2017 **Post-Doc Research Fellow**, *Dept. of Computer Science*, University of Verona.
Research activity on object recognition and behaviour modeling based on the integration of statistical pattern recognition and formal ontologies.
Design and production management of Multimedia infopoints – project **TOTEM**
- June 2015 – present **Associate Member**, *Institute of Cognitive Science and Technology (ISTC)*, Italian National Research Council (CNR).
September 2012 – May 2015 **Post-Doc Research Fellow**, *Institute of Cognitive Science and Technology (ISTC)*, Italian National Research Council (CNR).
2015 Research activity on integrating Knowledge Representation and Ontologies into Computer Vision and Pattern Recognition techniques – project **VisCoSo**
Research activity on behaviour analysis of spectators crowds – project **OZ**
- July 2011 – June 2012 **Marie Curie Fellow**, *Dept. of Mechanical and Structural Engineering*, University of Trento.
Research activity on automatic modeling of human body from multiple view video captured data (MoCap) – project **ABILE**
- July 2010 – June 2011 **Marie Curie Fellow**, *Dept. of Electrical Engineering and Computer Science*, Queen Mary University of London.
Research activity on automatic modeling of human body from multiple view video captured data (MoCap) – project **ABILE**
- April 2010 – June 2010 **Post-Doc Research Fellow**, *Dept. of Mechanical and Structural Engineering*, University of Trento.
Research activity: realization of a computer vision based system for 3D reconstruction and segmentation of human body – project **VERITAS**
- June – September 2009 **Visiting Ph.D. student**, *Instituto Superior Tecnico*, Universidade Tecnica de Lisboa.
Research activity: 3D points cloud registration and articulated motion segmentation, supervised by Dr. Alessio Del Bue

Projects

- Apr. 2017 – present **BCMS – Bird Concentration Monitoring System**, *funded by The Edge Company*.
Responsible for algorithms development, preliminary testing, and dissemination management.
- Nov. 2015 – present **TOTEM – Software and hardware design of Multimedia Infopoints for the project “Alta via della montagna veronese”**, *funded by Provincia di Verona*.
Responsible for project management, mechanical design, production management and verification.
- Sept. 2012 – April 2016 **VisCoSo – Detection of Crisis in Socio-Material Systems via VISual-Cognitive-Social Processes**, *funded by Provincia Autonoma di Trento*.
Scientific Participant: main expert of computer vision and pattern recognition
- Nov. 2013 – Dec. 2013 **OZ – Osservare l’attenZione (Observing attention)**, *funded by University of Trento*, Winter Universiade “Trentino 2013”.
Scientific Participant: data acquisition design and management, main expert of people detection and counting, disseminations.
- July 2010 – June 2012 **ABILE – Structure from Motion per la stima delle abilità motorie**, *Marie Curie Actions – COFUND*, progetto “Trentino”.
Principal Investigator
- January 2010 – June 2010 **VERITAS – Virtual and Augmented Environments and Realistic User Interactions To achieve Embedded Accessibility DesignS**, *Integrated Project (IP) within the 7th Framework Programme, Theme FP7-ICT-2009.7.2, Accessible and Assistive ICT*.
Scientific Participant: main expert of non-rigid 3D reconstruction with multiple cameras for human motion analysis.

Funding

- 120,000 EUR **Marie Curie Actions – COFUND, progetto “Trentino”**, *ABILE – Structure from Motion per la stima delle abilità motorie*, Queen Mary University of London & University of Trento.

Talks and seminars

- SSPandBE’17 **Indirect Match Highlights Detection with Deep Convolutional Neural Networks**, *International Workshop on Social Signal Processing and Beyond – in conj. with ICIAP*, Catania – Italy, Sept. 2017.
- TWSF’14 **OZ – Osservare l’attenZione**, *Trentino Winter Sport Forum – Winter Universiade “Trentino 2013”*, Baselga di Piné – Italy, Sept. 2014.
- VIGTA’13 **“Tell Me More”: How Semantic Technologies Can Help Refining Internet Image Search**, *International Workshop on Video and Image Ground Truth in Computer Vision Applications*, St. Petersburg – Russia, July 2013.
- JVRC’11 **How do human beings move? A lesson from driver models**, *Joint Virtual Reality Conference*, Nottingham – UK, July 2011.
- M&Q’09 **Stima dello stato di cottura di una pizza in produzione automatica mediante colorimetria (italian)**, *VI Congresso “Metrologia & Qualità”*, Turin – Italy, Sept. 2009.

Teaching Experience

Professor

- 2017–2018 **Laboratory of Computers Architecture**, *Bachelor Degree in Computer Science*, University of Verona.
Logical optimization, combinatorial and sequential circuit synthesis with SIS; Low-level programming with Assembly x86 AT&T.
- 2016–2017 **Laboratory of Computers Architecture**, *Bachelor Degree in Computer Science*, University of Verona.
Logical optimization, combinatorial and sequential circuit synthesis with SIS; Low-level programming with Assembly x86 AT&T.
- 2015–2016 **Laboratory of Computers Architecture**, *Bachelor Degree in Computer Science*, University of Verona.
Logical optimization, combinatorial and sequential circuit synthesis with SIS; Low-level programming with Assembly x86 AT&T.

Teaching Assistant

- 2008–2009 **Mechanical and Thermal Measurements**, *Bachelor Degree in Industrial Engineering*, University of Trento.

Professional Activities

Memberships

- GIRPR Gruppo Italiano Ricercatori in Pattern Recognition, since 2016 (card no. 635)
- IAPR International Association of Pattern Recognition, since 2016
- CVF The Computer Vision Foundation, since 2017 (card no. 5237)
- BMVA British Machine Vision Association and Society for Pattern Recognition, since 2011
- INSTICC Institute for Systems and Technologies of Information, Control and Communication, since 2017 (card no. 22501)

Workshop/Conference Organization

- Organizing Committee International Workshop on Computer Vision + Ontology Applied Cross-disciplinary Technologies (CONTACT) – @ECCV2014
- Program Committee Group And Crowd Behavior Analysis And Understanding (GROW) – @CVPR2015
- Committee IEEE International Workshop on Computer Vision in Sports (CVsports) – @IC-CV2015
- IEEE International Workshop on Computer Vision in Sports (CVsports) – @CVPR2017

Reviewer

Journals Computer Vision and Image Understanding (CVIU)
IEEE Transactions on Circuits and Systems for Video Technology
Neurocomputing
Pattern Recognition Letters
PLoS–One

Conferences ACM–Multimedia

Languages

Italian Native speaker
English Fluent

Computer skills

Operative Systems

Expert Windows, Linux
Comfortable Mac OS, Android

Programming languages

Expert Matlab, \LaTeX , LabView, Python
Comfortable C/C++, Processing, HTML, CSS, Assembly, SIS
Beginner JavaScript, PHP, Visual Basic, R

Publications

Metrics (source: Google Scholar on 10-10-2017)

Citations 186
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Journal Papers

- [J7] F. Setti, D. Conigliaro, P. Rota, C. Bassetti, N. Conci, N. Sebe, and M. Cristani. “The S-Hock dataset: A new benchmark for spectator crowd analysis”. In: *Computer Vision and Image Understanding* 159 (June 2017), pp. 47–58. DOI: 10.1016/j.cviu.2017.01.003.
- [J6] F. Setti, D. Conigliaro, M. Tobanelli, and M. Cristani. “Count on me: learning to count on a single image”. In: *IEEE Transactions on Circuits and Systems for Video Technology* In Press (2017). DOI: 10.1109/TCSVT.2017.2656718.
- [J5] N. Biasi, F. Setti, A. Del Bue, M. Tavernini, M. Lunardelli, A. Fornaser, M. Da Lio, and M. De Cecco. “Garment-Based Motion Capture (GaMoCap): high density capture of human shape in motion”. In: *Machine Vision and Applications* (July 2015), pp. 1–19. DOI: 10.1007/s00138-015-0701-2.

- [J4] D. S. Cheng, F. Setti, N. Zeni, R. Ferrario, and M. Cristani. "Semantically-driven automatic creation of training sets for object recognition". In: *Computer Vision and Image Understanding* 131 (Feb. 2015). Special section: Large Scale Data-Driven Evaluation in Computer Vision, pp. 56–71. DOI: 10.1016/j.cviu.2014.07.005.
- [J3] F. Setti, C. Russell, C. Bassetti, and M. Cristani. "F-formation Detection: Individuating Free-standing Conversational Groups in Images". In: *PLoS ONE* 10.9 (Sept. 2015), e0139160. DOI: 10.1371/journal.pone.0139160.
- [J2] F. Setti, R. Bini, M. Lunardelli, P. Bosetti, S. Bruschi, and M. De Cecco. "Shape measurement system for single point incremental forming (SPIF) manufactures by using trinocular vision and random pattern". In: *Measurement Science and Technology* 23.11 (Oct. 2012), p. 115402. DOI: 10.1088/0957-0233/23/11/115402.
- [J1] M. De Cecco, M. Pertile, L. Baglivo, M. Lunardelli, F. Setti, and M. Tavernini. "A Unified Framework for Uncertainty, Compatibility Analysis, and Data Fusion for Multi-Stereo 3-D Shape Estimation". In: *IEEE Transactions on Instrumentation and Measurement* 59.11 (Nov. 2010), pp. 2834–2842. DOI: 10.1109/TIM.2010.2060930.

Book chapters

- [B1] F. Setti and M. Cristani. "The GRODE Metrics". In: *Group and Crowd Behavior for Computer Vision*. 2017. Chap. 16, pp. 371–390.

Conference Papers

- [C17] M. Godi, P. Rota, and F. Setti. "Indirect Match Highlights Detection with Deep Convolutional Neural Networks". In: *SSP and BE workshop, in conjunction with ICIAP*. 2017.
- [C16] D. Conigliaro, P. Rota, F. Setti, C. Bassetti, N. Conci, N. Sebe, and M. Cristani. "The S-Hock Dataset: Analyzing Crowds at the Stadium". In: *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*. 2015.
- [C15] F. Setti and M. Cristani. "The GRODE Metrics: Exploring the Performance of Group Detection Approaches". In: *GROW workshop, in conjunction with CVPR*. 2015.
- [C14] D. Porello, F. Setti, R. Ferrario, and M. Cristani. "Multiagent Socio-Technical Systems. An Ontological Approach". In: *Coordination, Organizations, Institutions, and Norms in Agent Systems IX*. Vol. 8386. Lecture Notes in Computer Science. 2014, pp. 42–62. DOI: 10.1007/978-3-319-07314-9_3.
- [C13] D. Conigliaro, F. Setti, C. Bassetti, R. Ferrario, and M. Cristani. "ATTENTO: ATTENTION Observed for Automated Spectator Crowd Analysis". In: *Human Behavior Understanding*. Vol. 8212. Lecture Notes in Computer Science. Barcelona, Spain, Oct. 2013, pp. 102–111. DOI: 10.1007/978-3-319-02714-2_9.
- [C12] D. Conigliaro, F. Setti, C. Bassetti, R. Ferrario, and M. Cristani. "Viewing the Viewers: A Novel Challenge for Automated Crowd Analysis". In: *New Trends in Image Analysis and Processing – ICIAP*. Vol. 8158. Lecture Notes in Computer Science. Naples, Italy, Sept. 2013, pp. 517–526. DOI: 10.1007/978-3-642-41190-8_56.

- [C11] F. Setti, D.-S. Cheng, S. Abdulhak, R. Ferrario, and M. Cristani. "Ontology-Assisted Object Detection: Towards the Automatic Learning with Internet". In: *Image Analysis and Processing – ICIAP 2013*. Vol. 8157. Lecture Notes in Computer Science. Neaples, Italy, Sept. 2013, pp. 191–200. DOI: 10.1007/978-3-642-41184-7_20.
- [C10] F. Setti, H. Hung, and M. Cristani. "Group detection in still images by F-formation modeling: A comparative study". In: *14th International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS)*. Paris, France, July 2013, pp. 1–4. DOI: 10.1109/WIAMIS.2013.6616147.
- [C9] F. Setti, O. Lanz, R. Ferrario, V. Murino, and M. Cristani. "Multi-scale F-formation discovery for group detection". In: *20th IEEE International Conference on Image Processing (ICIP)*. Melbourne, Australia, Sept. 2013, pp. 3547–3551. DOI: 10.1109/ICIP.2013.6738732.
- [C8] F. Setti, D. Porello, R. Ferrario, S. Abdulhak, and M. Cristani. "'Tell Me More': How Semantic Technologies Can Help Refining Internet Image Search". In: *Proceedings of the International Workshop on Video and Image Ground Truth in Computer Vision Applications (VIGTA)*. St. Petersburg, Russia, July 2013, 3:1–3:6. DOI: 10.1145/2501105.2501110.
- [C7] I. Afanasyev, M. Lunardelli, N. Biasi, L. Baglivo, M. Tavernini, F. Setti, and M. De Cecco. "3D Human Body Pose Estimation by Superquadrics". In: *International Conference on Computer Vision Theory and Applications (VISAPP)*. Vol. 2. Rome, Italy, 2012, pp. 294–302.
- [C6] N. Biasi, F. Setti, M. Tavernini, A. Fornaser, M. Lunardelli, M. Da Lio, and M. De Cecco. "Low-cost Garment-based 3D Body Scanner". In: *3rd International Conference and Exhibition on 3D Body Scanning Technologies*. Lugano, Switzerland, Oct. 2012, pp. 106–114.
- [C5] L. Baglivo, A. Del Bue, M. Lunardelli, F. Setti, V. Murino, and M. De Cecco. "A Method for Asteroids 3D Surface Reconstruction from Close Approach Distances". In: *Computer Vision Systems*. Vol. 6962. Lecture Notes in Computer Science. Sophia Antipolis, France, Sept. 2011, pp. 21–30. DOI: 10.1007/978-3-642-23968-7_3.
- [C4] C. Russell, L. Agapito, and F. Setti. "Efficient Second Order Multi-Target Tracking with Exclusion Constraints". In: *Proceedings of the British Machine Vision Conference (BMVC)*. Dundee, UK, Sept. 2011, pp. 13.1–13.11. DOI: 10.5244/C.25.13.
- [C3] F. Setti, M. De Cecco, and A. Del Bue. "A multi-view stereo system for articulated motion analysis". In: *International Conference on Computer Vision Theory and Applications (VISAPP)*. Angers, France, May 2010, pp. 11–16.
- [C2] M. De Cecco, L. Baglivo, G. Parzianello, M. Lunardelli, F. Setti, and M. Pertile. "Uncertainty analysis for multi-stereo 3d shape estimation". In: *IEEE International Workshop on Advanced Methods for Uncertainty Estimation in Measurement (AMUEM)*. Bucharest, Romania, July 2009, pp. 22–27. DOI: 10.1109/AMUEM.2009.5207608.
- [C1] M. De Cecco, M. Pertile, L. Baglivo, G. Parzianello, M. Lunardelli, F. Setti, and A. Selmo. "Multi-stereo compatibility analysis for 3d shape estimation". In: *Proceedings of the IMEKO XIX World Congress*. Lisbon, Portugal, Sept. 2009, pp. 1909–1914.

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Francesco Setti