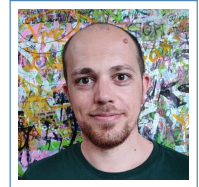


Federico Becattini

Curriculum Vitae

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Personal information

First name Federico
Last name Becattini
Place and date of birth Florence (Italy), 25 November 1989
Nationality Italian
Current position Tenure-Track Assistant Professor, (RTD-B), University of Siena
Research interests Computer Vision, Machine learning, Object Detection, Action Recognition, Autonomous Driving, Trajectory Prediction, Neuromorphic Vision, Garment Recommendation, Facial Micro-Expressions Analysis

Academic studies

Nov 2014 - Feb 2018 **PhD**, *Media Integration and Communication Center (MICC), Università degli studi di Firenze*
Scholarship: Fondo Giovani MIUR
Area: Pattern Recognition and Computer Vision
Subject: Object detection, Action recognition
Advisor: Prof. Alberto Del Bimbo
Dissertation: Object and Action annotations in visual media beyond categories

Mar 2012 - Oct 2014 **Master's degree in Computer Engineering**, *Università degli studi di Firenze*
Final degree mark: 110/110 cum laude
Thesis: Accelerating Exemplar-SVM label transfer
Advisors: Alberto Del Bimbo, Marco Bertini, Lorenzo Seidenari

Sep 2008 - Mar 2012 **Bachelor's degree in Computer Engineering**, *Università degli studi di Firenze*
Final degree mark: 101/110
Thesis: Statistical Relational Learning for Hedge Cue Detection
Advisor: Paolo Frasconi

Schools and Professional Training

July 2015 **International Computer Vision Summer School (ICVSS) 2015**
July 2016 **International Computer Vision Summer School (ICVSS) 2016**
August 2018 **IAPR Summer School on Machine and Vision Intelligence (VISMAL 2018)**

Teaching experiences

2015 - present **Teaching assistant**, *Visual and Multimedia Recognition*, Prof. Alberto del Bimbo, Università degli Studi di Firenze
Currently "Cultore della Materia"

2016 - present **Teaching assistant**, *Multimedia Design and Production*, Prof. Alberto del Bimbo, Università degli Studi di Firenze

2018 - 2019 **Adjunct Professor**, *Laboratorio di Tecnologia dell'Informazione*, 3 CFU, Università degli Studi di Firenze - Ingegneria Elettronica e delle Telecomunicazioni

2019 - 2020 **Adjunct Professor**, *Fondamenti di Informatica*, 9 CFU, Università degli Studi di Firenze - Ingegneria Elettronica e delle Telecomunicazioni

- 2020 - 2022 **Adjunct Professor**, *Fondamenti di Informatica*, 6 CFU, Università degli Studi di Firenze - Ingegneria Meccanica, Ingegneria Gestionale
- 2022 - present **Assistant Professor**, *Programming for Data Science*, 6 CFU, Università degli Studi di Siena - Engineering Management

Lectures and short courses

- August 2018 **Incremental learning of person identities**, *IAPR Summer School on Machine and Vision Intelligence (VISMAL 2018)*, with Prof. Alberto del Bimbo and Ing. Matteo Bruni, Vico Equense, Italy
- April 2021 **Memory Networks**, *AIDA PhD short course - 2 ECTS*, with Prof. Alberto del Bimbo, Online
- May 2022 **From recurrent neural networks to memory augmented neural networks**, *Tutorial in conjunction with ICIAP2021*, Lecce, Italy
- October 2022 **Memory Networks**, *Tutorial in conjunction with ACM MM 2022*, with Ing. Tiberio Uricchio, Lisbon, Portugal
- January 2023 **Deep Learning with Memory**, *PhD course at Università degli Studi di Firenze*, Florence, Italy, 12 hours
- February 2023 **Information Retrieval**, *Master course at Università IUAV di Venezia*, Venice, Italy, 20 hours
- May 2023 **Deep Learning with Memory**, *PhD course at Università degli Studi di Siena*, Siena, Italy, 20 hours
- September 2023 **Deep Learning with Memory**, *Tutorial in conjunction with IAPR Summer School on Machine and Vision Intelligence (VISMAL 2023)*, Padova, Italy

Professional Experiences

- Nov 2014 - Ott 2015 **Research fellow**, *Media Integration and Communication Center (MICC), Università degli Studi di Firenze*
Subject: Research and development of efficient techniques for semantic image annotation (THE SOCIAL MUSEUM AND SMART TOURISM, MIUR project no. CTN01 00034 23154 SMST)
- Nov 2017 - Ott 2018 **Research fellow**, *Media Integration and Communication Center (MICC), Università degli Studi di Firenze*
Subject: Studio e sviluppo di un Sistema integrato per la mappatura ed il posizionamento delle persone all'interno di edifici (MAPPER - Tuscany POR FESR 2014-2020)
- Nov 2018 - Ott 2021 **Research fellow**, *Media Integration and Communication Center (MICC), Università degli Studi di Firenze*
Subject: Sviluppo e implementazione di sistemi di visione artificiale per piattaforma ICT per beni culturali (IDEHA - FESR FSE PON Ricerca e Innovazione 2014-2020)
- Nov 2021 - Ott 2022 **Research fellow**, *Media Integration and Communication Center (MICC), Università degli Studi di Firenze*
Subject: Predizione di traiettorie di osservazione su video 360 con deep network. (AI4MEDIA - A European Excellence Centre for Media, Society and Democracy, EU Horizon 2020 research and innovation programme)
- Nov 2022 - present **Tenure Track Assistant Professor (RTD-B)**, *Università degli Studi di Siena*

Involvement in research and industrial projects

- 2015 **SMST**, *The Social Museum and Smart Tourism*, MIUR project no. CTN01 00034 23154 SMST
- 2016 **Innovecento**, *Museo Novecento Innovation Lab*, Municipality of Florence

- 2017 **MAPPER**, *Studio e sviluppo di un sistema integrato per la mappatura ed il posizionamento della persona all'interno degli edifici*, Tuscany POR FESR 2014-2020
- 2017 **eServant**, *Events in crowded places A smart service management*, Tuscany POR-CReO FESR 2014-2020
- 2018 **IDEHA**, *Improving the customer experience in stores by intelligent computer vision*, PON SUD
- 2018 **IMRA**, *Research collaboration with industrial partner IMRA-EUROPE SAS*
- 2020 **I-MALL**, *Improving the customer experience in stores by intelligent computer vision*, PRIN 2017
- 2022 **AI4MEDIA**, *A European Excellence Centre for Media, Society and Democracy*, EU Horizon 2020 research and innovation programme

Scientific Community services

- Associate Editor **International Journal of Multimedia Information Retrieval**, Springer
- Guest Editor **Special Issue on Eyes on People: Recent Trends on Human Analysis, Perception and Generation**, Computer Vision and Image Understanding, 2023
- Guest Editor **Special Issue on Computer Vision in Human Analysis: From Face and Body to Clothes**, Sensors, 2022
- Guest Editor **Special Issue on Deep Learning for Augmented and Virtual Reality: from Detection to Forecasting**, Sensors, 2023
- Conference Organization ECCV 2012 volunteer, CBMI 2017 volunteer, ICCV 2017 volunteer, ICPR 2020 organization team
- Area Chair **ACM Conference on Multimedia (ACM MM)**, 2023
- Workshop Organization **Facial and Body Expressions, micro-expressions and behavior recognition (FBE2020)** in conjunction with ICPR 2020
- Workshop Organization **Towards a Complete Analysis of People: From Face and Body to Clothes (T-CAP)** in conjunction with ICIAP 2021
- Workshop Organization **Towards a Complete Analysis of People: From Face and Body to Clothes (T-CAP)** in conjunction with ICPR 2022
- Workshop Organization **Multimedia Computing towards Fashion Recommendation** in conjunction with ACM MM 2022
- Workshop Organization **1st International Workshop and Challenge on People Analysis: from face, body and fashion to 3d virtual avatars** in conjunction with ECCV 2022
- Session Chair Vision for Art workshop, ECCV, 2022
- Conference and workshop reviewing CVPR, ICCV, ECCV, CBMI, ACM MM, ICPR, IJCAI, ICIAP, ICMR, ISM, ICCV CHI workshop, SAIAD workshop, VIQA workshop
- Journal reviewing IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Multimedia, ACM Transactions on Multimedia Computing and Applications, Pattern Recognition, Multimedia Tools and Applications, Pattern Analysis and Applications, Electronics, Sensors, Informatics, Expert Systems With Applications, Transactions on Industrial Informatics

Patents

EP3916676 - *Computer-implemented method for predicting multiple future trajectories of moving objects*, **Becattini Federico**, Marchetti Francesco, Seidenari Lorenzo, Del Bimbo Alberto, Abad Frédéric, Buchicchio Kevin, Bendahan Rémy

Awards

- Best paper award "Imaging Novecento. A Mobile App for Automatic Recognition of Artworks and Transfer of Artistic Styles", *Euro-Mediterranean Conference EUROMED*, 2016
- Best poster award "Am I done? predicting action progress in videos", *IAPR Summer School on Machine and Vision Intelligence, VISMAL* 2018
- Travel grant award *Anticipating Human Behavior workshop*, ECCV 2018
- Honorable mention Argoverse Motion Forecasting Challenge, *in conjunction with Workshop on Autonomous Driving (WAD)*, CVPR 2020
- Best paper award "Deep Variational Learning for Multiple Trajectory Prediction of 360° Head Movements", *MMSys 2022*

Languages

- Italian Mother tongue
- English Fluent
- Language certification Key English Test (KET)
Preliminary English Test (PET)
First Certificate in English (FCE)

Information Technology Skills

- Basic PHP, Prolog, UML, SQL
- Intermediate Java, Javascript, Bash, C/C++
- Expert Matlab, Python
- Tools and Libraries OpenCV, OpenMP, gSOAP, SMCube, jQuery, Arduino, Raspberry Pi, Caffe, MatConvNet, Keras, TensorFlow, Pytorch, Django, Docker, Git
- Miscellaneous Windows, Linux, Office/OpenOffice, L^AT_EX, Photoshop
- Certification European Computer Driving Licence (ECDL)

Publications

International Conferences and Workshops

F. Becattini, L. Seidenari, A. Del Bimbo, "Indexing ensembles of exemplar-svms with rejecting taxonomies", In Proc. of *Content-Based Multimedia Indexing (CBMI)*, 2016

G. Cuffaro, **F. Becattini**, C. Baecchi, L. Seidenari, A. Del Bimbo, "Segmentation Free Object Discovery in Video", in Proc. of *European Conference on Computer Vision (ECCV) 2016, Workshop on Brave New Ideas in Motion Representation*

F. Becattini, A. Ferracani, L. Landucci, D. Pezzatini, T. Uricchio, A. Del Bimbo, "Imaging Novecento. A Mobile App for Automatic Recognition of Artworks and Transfer of Artistic Styles", in Proc. of *Euro-Mediterranean Conference (EUROMED)*, 2016 (**best paper award**)

F. Becattini, L. Seidenari, L. Berlincioni, L. Galteri, A. Del Bimbo, "Vehicle Trajectories from Unlabeled Data through Iterative Plane Registration", in Proc. of *International Conference on Image Analysis and Processing (ICIAP)*, 2019

F. Becattini, A. Ferracani, F. Principi, M. Ghianni, A. Del Bimbo, "NeuronUnityIntegration2.0. A Unity Based Application for Motion Capture and Gesture Recognition", in Proc. of *International Conference on Multimedia, Demo*, 2019

F. Marchetti, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Mantra: Memory augmented networks for multiple trajectory prediction", in Proc. of *International Conference on Computer Vision and Pattern Recognition, 2020*

L. Cultrera, L. Seidenari, **F. Becattini**, P. Pala, A. Del Bimbo, "Explaining Autonomous Driving by Learning End-to-End Visual Attention", in Proc. of *International Conference on Computer Vision and Pattern Recognition, Workshop on Safe Artificial Intelligence for Automated Driving, 2020*

P. Bongini, **F. Becattini**, A. Bagdanov, A. Del Bimbo, "Visual Question Answering for Cultural Heritage", in Proc. of *Florence Heritech, 2020*

L. Berlincioni, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Multiple Future Prediction Leveraging Synthetic Trajectories", in Proc. of *International Conference on Pattern Recognition, 2020*

S. Undri Innocenti, **F. Becattini**, F. Pernici, A. Del Bimbo, "Temporal Binary Representation for Event-Based Action Recognition", in Proc. of *International Conference on Pattern Recognition, 2020*

L. De Divitiis, **F. Becattini**, C. Baecchi, A. Del Bimbo, "Garment Recommendation with Memory Augmented Neural Networks", in Proc. of *International Conference on Pattern Recognition, Workshop on Visual-Textual Image Understanding and Retrieval, 2020*

L. De Divitiis, **F. Becattini**, C. Baecchi, A. Del Bimbo, "Style-Based Outfit Recommendation", In Proc. of *Content-Based Multimedia Indexing (CBMI), 2021*

F. Becattini, X. Song, C. Baecchi, S. Fang, C. Ferrari, L. Nie, A. Del Bimbo, "PLM-IPE: A Pixel-Landmark Mutual Enhanced Framework for Implicit Preference Estimation", In Proc. of *ACM MM ASIA, 2022*

Q. Guimard, L. Sassatelli, F. Marchetti, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Deep Variational Learning for Multiple Trajectory Prediction of 360° Head Movements", In Proc. of *MMSys, 2022 (best paper award)*

A. Alfani, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Online Deep Clustering with Video Track Consistency", in Proc. of *International Conference on Pattern Recognition, 2022 (to appear)*

A. Ciamarra, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Forecasting Future Instance Segmentation with Learned Optical Flow and Warping", in Proc. of *International Conference on Image Analysis and Processing (ICIAP), 2021*

F. Becattini, G. Becchi, A. Ferracani, A. Del Bimbo, L. Lo Presti, G. Mazzola, M. La Cascia, F. Cunico, A. Toiari, M. Cristani, A. Greco, A. Saggese, M. Vento, "I-MALL An Effective Framework for Personalized Visits. Improving the Customer Experience in Stores", in Proc. of *ACM Multimedia (ACM MM) 2022 workshops*

F. Becattini, T. Uricchio, "Memory Networks", in Proc. of *ACM Multimedia (ACM MM) 2022*

X. Song, J. Chen, **F. Becattini**, W. Guan, Y. Zhan, T. S. Chua, "MCFR'22: 1st Workshop on Multimedia Computing towards Fashion Recommendation", in Proc. of *ACM Multimedia (ACM MM) 2022*

P. Bongini, **F. Becattini**, A. Del Bimbo, "Is GPT-3 all you need for Visual Question Answering in Cultural Heritage?", in Proc. of *European Conference on Computer Vision (ECCV) 2022 workshops*

F. Marchetti, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Explainable Sparse Attention for Memory-based Trajectory Predictors", in Proc. of *European Conference on Computer Vision (ECCV) 2022 workshops*

L. Berlincioni, L. Cultrera, C. Albisani, L. Cresti, A. Leonardo, S. Picchioni, **F. Becattini**, A. Del Bimbo, "Neuromorphic Event-based Facial Expression Recognition", in Proc. of *Computer Vision and Pattern Recognition (CVPR) 2023 workshops*

L. Agnolucci, A. Baldrati, F. Todino, **F. Becattini**, M. Bertini, A. Del Bimbo, "ECO: Ensembling Context Optimization for Vision-Language Models", in Proc. of *International Conference on Computer Vision 2023 workshops*

D. Cioni, L. Berlincioni, **F. Becattini**, A. Del Bimbo, "Diffusion Based Augmentation for Captioning and Retrieval in Cultural Heritage", in Proc. of *International Conference on Computer Vision 2023 workshops*

Book Chapters

L. Berlincioni, **F. Becattini**, L. Galteri, L. Seidenari, A. Del Bimbo, "Semantic Road Layout Understanding by Generative Adversarial Inpainting", *Inpainting and Denoising Challenges. The Springer Series on Challenges in Machine Learning.*, 2019

International Journals

F. Becattini, L. Seidenari, A. Del Bimbo, "Indexing quantized ensembles of exemplar-SVMs with rejecting taxonomies", In *Multimedia Tools and Applications*, 2017. (Special Issue: Content Based Multimedia Indexing)

F. Becattini, T. Uricchio, L. Seidenari, A. Del Bimbo, L. Ballan, "Am I done? predicting action progress in videos", *ACM Trans. on Multimedia Computing, Communications, and Applications (TOMM)*, 2020

F. Marchetti, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Multiple Trajectory Prediction of Moving Agents with Memory Augmented Networks", *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2020

C. Ferrari, **F. Becattini**, L. Galteri, A. Del Bimbo, "(Compress and Restore)^N: a Robust Defense Against Adversarial Attacks on Image Classification", *ACM Trans. on Multimedia Computing, Communications, and Applications (TOMM)*, 2022

L. De Divitiis, **F. Becattini**, C. Baecchi, A. Del Bimbo, "Disentangling Features for Fashion Recommendation", *ACM Trans. on Multimedia Computing, Communications, and Applications (TOMM)*, 2022

F. Becattini, F. Palai, A. Del Bimbo, "Understanding human reactions looking at facial micro-expressions with an event camera", *IEEE Transactions on Industrial Informatics*, 2022

F. Becattini, A. Ferracani, G. Becchi, A. Del Bimbo, "Events in Crowded Places: a Smart Service Management", *Pattern Recognition Letters*, 2022

D. Pucci, **F. Becattini**, A. Del Bimbo, "Joint-Based Action Progress Prediction", *Sensors*, 2023

L. Cultrera, L. Seidenari, **F. Becattini**, P. Pala, A. Del Bimbo, "Explaining autonomous driving with visual attention and end-to-end trainable region proposals", *Journal of Ambient Intelligence and Humanized Computing*, 2023

F. Becattini, P. Bongini, L. Bulla, A. Del Bimbo, L. Marinucci, M. Mongiovì, V. Presutti, "VISCOUNT: A Large-Scale Multilingual Visual Question Answering Dataset for Cultural Heritage", *ACM Transactions on Multimedia Computing, Communications and Applications (TOMM)*, 2023

F. Becattini, L. De Divitiis, C. Baecchi, A. Del Bimbo, "Fashion Recommendation Based on Style and Social Events", *Multimedia Tools and Applications (MTAP)*, 2023

F. Becattini, F. Teotini, A. Del Bimbo, "Transformer-based Graph Neural Networks for Outfit Generation", *IEEE Transactions on Emerging Topics in Computing*, 2023

F. Becattini, C. Bisogni, V. Loia, C. Pero, F. Hao, "Head Pose Estimation Patterns as Deepfake Detectors", *ACM Transactions on Multimedia Computing, Communications and Applications (TOMM)*, 2023

G. Scaramuzzino, **F. Becattini**, A. Del Bimbo, "Attribute disentanglement with gradient reversal for interactive fashion retrieval", *Pattern Recognition Letters*, 2023

Other

F. Becattini, L. Seidenari, A. Del Bimbo, "Indexing ensembles of exemplar-svms with rejecting taxonomies", poster presentation at *International Computer Vision Summer School (ICVSS) 2015*

F. Becattini, L. Seidenari, T. Uricchio, A. Del Bimbo, L. Ballan, "Am I done? predicting action progress in videos", poster presentation at *Anticipating Human Behavior workshop*, ECCV 2018, Munich

F. Becattini, L. Seidenari, T. Uricchio, A. Del Bimbo, L. Ballan, "Am I done? predicting action progress in videos", oral and poster presentation at *IAPR Summer School on Machine and Vision Intelligence*, VISMAL 2018, Vico Equense (**best poster award**)

L. Berlincioni, **F. Becattini**, L. Galteri, L. Seidenari, A. Del Bimbo, "Semantic Road Layout Understanding by Generative Adversarial Inpainting", oral presentation at *Chalarn Satellite Workshop on Image and Video Inpainting*, ECCV 18, Munich

F. Marchetti, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Multi-modal trajectory prediction in Carla simulator", demo at *European Conference on Computer Vision*, ECCV 20, Glasgow

F. Marchetti, **F. Becattini**, L. Seidenari, A. Del Bimbo, "Multimodal trajectory prediction in the CARLA simulator", demo at *International Conference on Pattern Recognition*, ICPR 20, Milan

F. Vannoni, P. Bongini, **F. Becattini**, A. Bagdanov, A. Del Bimbo, "Data Collection for Contextual and Visual Question Answering in the Cultural Heritage Domain", demo at *International Conference on Pattern Recognition*, ICPR 20, Milan

Speaker at International Conferences

- Bucharest 2016 "Indexing ensembles of exemplar-svms with rejecting taxonomies", Content-Based Multimedia Indexing (CBMI)
- Amsterdam 2016 "Segmentation Free Object Discovery in Video", European Conference on Computer Vision (ECCV) 2016, Workshop on Brave New Ideas in Motion Representation
- Munich 2018 "Semantic Road Layout Understanding by Generative Adversarial Inpainting", European Conference on Computer Vision (ECCV) 2018, Workshop on Image and Video Inpainting
- Munich 2018 "Am I done? Predicting Action Progress in Videos", European Conference on Computer Vision (ECCV) 2018, Workshop on Anticipating Human Behavior
- Trento 2019 "Vehicle Trajectories from Unlabeled Data through Iterative Plane Registration", International Conference on Image Analysis and Processing (ICIAP)
- Seattle 2020 "Mantra: Memory augmented networks for multiple trajectory prediction", International Conference on Computer Vision and Pattern Recognition (CVPR)
- Seattle 2020 "Explaining Autonomous Driving by Learning End-to-End Visual Attention", International Conference on Computer Vision and Pattern Recognition (CVPR), Workshop on Safe Artificial Intelligence for Automated Driving

- Glasgow 2020 "Multi-modal trajectory prediction in Carla simulator", European Conference on Computer Vision (ECCV)
- Milan 2020 "Multiple Future Prediction Leveraging Synthetic Trajectories", International Conference on Pattern Recognition (ICPR)
- Milan 2020 "Temporal Binary Representation for Event-Based Action Recognition", International Conference on Pattern Recognition (ICPR)
- Montreal 2022 "Online Deep Clustering with Video Track Consistency", International Conference on Pattern Recognition (ICPR)
- Lecce 2022 "Memory Networks", International Conference on Image Analysis and Processing (ICIAP)
- Lecce 2022 Activities of UNIFI-MICC in Digital Humanities, Round Table at the Artificial Intelligence for Digital Humanities workshop, International Conference on Image Analysis and Processing (ICIAP)
- Tel Aviv 2022 "Is GPT-3 all you need for Visual Question Answering in Cultural Heritage?", European Conference on Computer Vision (ECCV) 2022
- Tel Aviv 2022 "Explainable Sparse Attention for Memory-based Trajectory Predictors", European Conference on Computer Vision (ECCV) 2022