MICHELE MERLER

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EDUCATION

2013	:	**Ph.D. degree in Computer Science** Columbia University, New York Advisor: Professor John Kender
2008	:	**M.S. degree in Computer Science** Columbia University, New York
2007	:	**M.Eng. degree in Telecommunications Engineering (Summa cum Laude)** University of Trento, Italy
2004	:	**B.Eng. degree in Telecommunications Engineering (Summa cum Laude)** University of Trento, Italy

PROFESSIONAL EXPERIENCE

May 2012 - present	:	**IBM T.J. Watson Research Center** Senior Research Scientist, IBM Research Worked on: large language models for code, knowledge distillation of language models, entity standardization for application modernization, neural architecture search for vision and language models, automatic extraction of highlights from sporting events based on multimodal excitement features, topic modelling and visualization using transformers, deep learning based facial attributes estimation, fine grained image food recognition, attributes estimation from social media profiles by analysis of multimodal content, medical image modality recognition, events recognition in large scale video collections based on semantic model vectors
September 2007- May 2012	:	**Columbia University, New York** Graduate research assistant, High Level Vision Lab Advisor: Professor John Kender Analysis, indexing and enhancement of unstructured videos of presentations based on textual, graphical and facial cues
Summers 2008, 2009, 2010	:	**IBM T.J. Watson Research Center** Intern, Multimedia and Vision Research Group Manager: Apostol Natsev, Mentors: Rong Yan, Gang Hua, Lexing Xie Developed methods for complex video event detection and recognition, imbalanced boosting for combining ranking features on large scale databases, local feature-based representations for general and face recognition in multimedia collections
Summer 2006	:	**California Institute for Telecommunications and Information Technology** Intern, University of California San Diego branch Advisor: Professor Serge Belongie

Developed a multimedia database of groceries in the frame-work of the GroZi project. Performance evaluation of state of the art object detection and recognition algorithms on such dataset

Summer 2004 : **Create-Net International Research Center**
Researcher, Trento, Italy branch
Advisor: Professor Francesco De Natale

Developed human detection, visual tracking and user-computer interaction algorithms for real time applications

RESEARCH INTERESTS

Broad Interests: Multimedia Indexing and Retrieval, Computer Vision, NLP, Machine Learning (deep and shallow), LLM, AI for code

Specific Interests: CodeLLM, entity standardization, neural architecture search, video highlights extraction, deep learning for image and video classification, edge AI, topic modeling, facial attributes estimation, use of semantic representations for large scale image/video retrieval, bias estimation and mitigation in visual classification

Programming Languages/Libraries: Python, C/C++, OpenCV, PyTorch

HONORS AND SCHOLARSHIPS

Best Paper Award "Harnessing Remote Speech Tasks for Early ALS Biomarker Identification" at IEEE ICDH (2024)

Technology & Engineering Emmy Award (AI-ML curation of Sports Highlights) (2023)

IBM Outstanding Technical Achievement (Konveyor Open-Source Community) (2023)

Outstanding Reviewer at CVPR (2021)

IBM Corporate Award (AI Video Enrichment and Editing) (2019)

IBM Research Division Award (Watson Visual Recognition Services Contributions) (2018)

Best Digital Development, Yahoo Sports Tech Awards (Wimbledon Cognitive Highlights) (2018)

Best Reviewer Award at ICMR (2015)

IBM Research Division Award (Multimedia Semantic Modeling) (2013)

First Place in ImageCLEF Medical Image Modality Classification (2012 and 2013)

IBM Outstanding Technical Accomplishment (Multimedia group) (2012)

Yahoo! Key Scientific Challenge Award (2009)

VideOlympics "People's Choice Award" (group) for IMARS Multimedia Retrieval System, ACM CIVR (2008)

California Institute of Information and Telecommunications Technology Summer Undergraduate Research Scholarship (2006)

University of Trento International Cooperation and Mobility Program: University of California Scholarship (2005-2006)

ACADEMIC TEACHING EXPERIENCE

Fall 2010 and Spring 2011 : **Columbia University Department of Computer Science**
COMS 1003 - Introduction to Computer Science and Programming in C
Full Course (3 credits)
http://www1.cs.columbia.edu/~mmerler/coms1003-1.html

<table>
<tr><td>Fall 2009 and Spring 2010</td><td>:</td><td>**Columbia University Department of Computer Science**</td></tr>
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COMS 3101 - Programming Languages (Matlab)
Short Course (1 credit)
http://www1.cs.columbia.edu/~mmerler/comsw3101-2.html

PUBLICATIONS

1. Carla Agurto, **Michele Merler**, Esteban Roitberg, Alan Taitz, Marcos A. Trevisan, Diego E. Shalom, Julian Peller, Lyle W. Ostrow, Indu Navar, Ernest Fraenkel, James Berry, Guillermo A. Cecchi and Raquel Norel. "Harnessing Remote Speech Tasks for Early ALS Biomarker Identification". *IEEE International Conference on Digital Health (ICDH),* 2024

2. Carla Agurto, **Michele Merler**, Jenna Reinen, Pritish Parida, Guillermo Cecchi, Jeffrey L. Rogers, Navitas And Envision Studies Physician Author Group and Boston Scientific Research Scientists Consortium. "Exploring Chronic Pain Experiences: Leveraging Text and Audio Analysis to Infer Well-Being Metrics". *IEEE International Conference on Digital Health (ICDH),* 2024

3. Rikke Gade, **Michele Merler**, Graham Thomas and Thomas B Moeslund. "The (Computer) Vision of Sports: Recent Trends in Research and Commercial Systems for Sport Analytics". *Chapter 14 in Computer Vision: Challenges, Trends, and Opportunities, CRC Press,* 2024

4. Mayank Mishra, Matt Stallone, Gaoyuan Zhang, Yikang Shen, Aditya Prasad, Adriana Meza Soria, **Michele Merler**, Parameswaran Selvam, Saptha Surendran, Shivdeep Singh, Manish Sethi, Xuan-Hong Dang, Pengyuan Li, Kun-Lung Wu, Syed Zawad, Andrew Coleman, Matthew White, Mark Lewis, Raju Pavuluri, Yan Koyfman, Boris Lublinsky, Maximilien de Bayser, Ibrahim Abdelaziz, Kinjal Basu, Mayank Agarwal, Yi Zhou, Chris Johnson, Aanchal Goyal, Hima Patel, Yousaf Shah, Petros Zerfos, Heiko Ludwig, Asim Munawar, Maxwell Crouse, Pavan Kapanipathi, Shweta Salaria, Bob Calio, Sophia Wen, Seetharami Seelam, Brian Belgodere, Carlos Fonseca, Amith Singhee, Nirmit Desai, David D. Cox, Ruchir Puri, Rameswar Panda. "Granite Code Models: A Family of Open Foundation Models for Code Intelligence". *arXiv preprint arXiv: 2405.04324*, 2024

5. Rangeet Pan, Ali Reza Ibrahimzada, Rahul Krishna, Divya Sankar, Lambert Pouguem Wassi, **Michele Merler**, Boris Sobolev, Raju Pavuluri, Saurabh Sinha, Reyhaneh Jabbarvand. "Lost in translation: A study of bugs introduced by large language models while translating code", *International Conference on Software Engineering* (*ICSE),* 2024

6. Rangeet Pan, Rahul Krishna, **Michele Merler**, Raju Pavuluri, Saurabh Sinha, Maja Vukovic. "What would be an Ideal Code LLM? An Industrial Perspective", *2030 Software Engineering Workshop at FSE*, 2024

7. Masayasu Muraoka, Bishwaranjan Bhattacharjee, **Michele Merler**, Graeme Blackwood, Yulong Li, Yang Zhao. "Cross-Lingual Transfer of Large Language Model by Visually-Derived Supervision Toward Low-Resource Languages", in *ACM Multimedia*, 2023

8. Takuma Udagawa, Aashka Trivedi, **Michele Merler**, Bishwaranjan Bhattacharjee. "A Comparative Analysis of Task-Agnostic Distillation Methods for Compressing Transformer Language Models", *EMNLP*, 2023

9. Jiaqing Yuan, **Michele Merler**, Mihir Choudhury, Raju Pavuluri, Munindar P. Singh, Maja Vukovic. "CoSiNES: Contrastive Siamese Network for Entity Standardization". *Matching Workshop at ACL*, 2023

10. Aashka Trivedi, Takuma Udagawa, **Michele Merler**, Rameswar Panda, Yousef El-Kurdi, Bishwaranjan Bhattacharjee. "Neural Architecture Search for Effective Teacher-Student Knowledge Transfer in Language Models", *arXiv preprint arXiv: 2303.09639*, 2023

11. Rameswar Panda, **Michele Merler,** Mayoore Jaiswal, Hui Wu, Kandan Ramakrishnan, Ulrich Finkler, Chun-Fu Chen, Minsik Cho, David Kung, Rogerio Feris, Bishwaranjan Bhattacharjee. "NASTransfer: Analyzing Architecture Transferability in Large Scale Neural Architecture Search", *35th AAAI Conference on Artificial Intelligence (AAAI)*, 2021

12. Ulrich Finkler, **Michele Merler**, Rameswar Panda, Mayoore S Jaiswal, Hui Wu, Kandan Ramakrishnan, Chun-Fu Chen, Minsik Cho, David Kung, Rogerio Feris, Bishwaranjan Bhattacharjee. "Large Scale Neural Architecture Search with Polyharmonic Splines", *AAAI Workshop on Meta-Learning for Computer Vision (MeL4CV),* 2021

13. **Michele Merler**, Cicero N Santos, Mauro Martino, Alfio M Gliozzo, John R Smith. "Covering the news with (AI) Style", *arXiv preprint arXiv:2002.02369*, 2020

14. **Michele Merler**, Nalini Ratha, Rogerio S Feris, John R Smith. "Diversity in Faces", *arXiv preprint arXiv:1901.10436*, 2019

15. **Michele Merler**, Dhiraj Joshi, Quoc-Bao Nguyen, Stephen Hammer, John Kent, Jinjun Xiong, Minh N. Do, John R Smith, Rogerio S Feris. "Automatic Curation of Sport Highlights using Multimodal Excitement Features", *IEEE Transactions on Multimedia,* 2018

16. **Michele Merler**, Dhiraj Joshi, Quoc-Bao Nguyen, Stephen Hammer, John Kent, John R Smith, Rogerio S Feris. "Automatic Curation of Golf Highlights using Multimodal Excitement Features", *3rd Workshop on Computer Vision in Sports @CVPR,* 2017

17. Dhiraj Joshi, **Michele Merler**, Quoc-Bao Nguyen, Stephen Hammer, John Kent, John R Smith, Rogerio S Feris, "IBM High-Five: Highlights From Intelligent Video Engine". *ACM Multimedia,* 2017

18. Xiaolong Wang, Guodong Guo, **Michele Merler**, Noel CF Codella, MV Rohith, John R Smith, Chandra Kambhamettu, "Leveraging multiple cues for recognizing family photos", *Journal of Image and Vision Computing, 2017*

19. **Michele Merler**, Hui Wu, Rosario Uceda-Sosa, Quoc-Bao Nguyen, John R Smith, "Snap, Eat, RepEat: a food recognition engine for dietary logging", *2nd International Workshop on Multimedia Assisted Dietary Management @ACM Multimedia,* 2016

20. Hui Wu, **Michele Merler**, Rosario Uceda-Sosa, John R Smith, "Learning to make better mistakes: Semantics-aware visual food recognition", *ACM Multimedia,* 2016

21. Quan Zou, Wei Liu, **Michele Merler**, Rongrong Ji, "Advanced learning for large-scale heterogeneous computing", *Neurocomputing Journal*, Issue 217, 2016

22. **Michele Merler**, Liangliang Cao, John R Smith, "You are what you tweet… pic! gender prediction based on semantic analysis of social media images", *IEEE International on Conference on Multimedia and Expo (*ICME*),* 2015

23. Junjie Cai, **Michele Merler**, Sharath Pankanti, Qi Tian, "Heterogeneous semantic level features fusion for action recognition", *IEEE International on Conference on Multimedia Retrieval (ICMR),* 2015

24. Mani Abedini, Noel CF Codella, Jonathan H Connell, Rahil Garnavi, **Michele Merler**, Sharath Pankanti, John R Smith, Tanveer Syeda-Mahmood, "A generalized framework for medical image classification and recognition", *IBM J. of Research and Development,* 2015

25. John R Smith, Liangliang Cao, Noel CF Codella, Matthew L Hill, **Michele Merler**, Q-B Nguyen, E Pring, Rosario A Uceda-Sosa, "Massive-scale learning of image and video semantic concepts", *IBM Journal of Research and Development*, Volume 59, Issue 2/3, 2015

26. Felix X Yu, Liangliang Cao, **Michele Merler**, Noel Codella, Tao Chen, John R Smith, Shih-Fu Chang. "Modeling attributes from category-attribute proportions", *ACM Multimedia,* 2014

27. Noel Codella, Jonathan Connell, Sharath Pankanti, **Michele Merler**, John R Smith, "Automated medical image modality recognition by fusion of visual and text information", *International Conference on Medical Image Computing and Computer-Assisted Intervention(MICCAI),* 2014

28. Noel Codella, Gang Hua, Liangliang Cao, **Michele Merler**, Leiguang Gong, Matt Hill, John R Smith, "Large-scale video event classification using dynamic temporal pyramid matching of visual semantics", *International Conference on Image Processing (ICIP)*, 2013

29. Mani Abedini, Liangliang Cao, Noel Codella, Jonathan H Connell, Rahil Garnavi, Amir Geva, **Michele Merler**, Quoc-Bao Nguyen, Sharathchandra U Pankanti, John R Smith, Xingzhi Sun, Asaf Tzadok, "IBM research at ImageCLEF 2013 medical tasks", *American Medical Informatics Association (AMIA) ImageCLEF, Medical Image Retrieval Workshop*, 2013. Ranked #1 in Medical Image Modality Classification Task

30. Lisa Brown, Liangliang Cao, Shih-Fu Chang, Yu Cheng, Alok Choudhary, Noel Codella, Courtenay Cotton, Dan Ellis, Quanfu Fan, Rogerio Feris, Leiguang Gong, Matthew Hill, Gang Hua, John Kender, **Michele Merler**, Yadong Mu, Sharath Pankanti, John R Smith, FX Yu, "IBM Research and Columbia University trecvid-2013 multimedia event detection (med), multimedia event recounting (mer), surveillance event detection (sed), and semantic indexing (sin) systems", *NIST TRECVID Workshop*, 2013

31. **Michele Merler**, Bert Huang, Lexing Xie, Gang Hua, and Apostol Natsev, "Semantic Model Vectors for Complex Video Event Recognition", *IEEE Transactions on Multimedia, Special issue on Object and Event Classification in Large-Scale Video Collections*, 2012

32. F. Yu., L Cao, SF Chang, N Codella, C Cotton, D Ellis, L Gong, M Hill, G Hua, J Kender, **M Merler**, Y Mu, J Smith, "IBM Research and Columbia University TRECVID-2012 Multimedia Event Detection (MED), Multimedia Event Recounting (MER), and Semantic Indexing (SIN) Systems", *NIST TRECVID Workshop*, 2012

33. Liangliang Cao, Yuan-Chi Chang, Noel Codella, **Michele Merler**, Quoc-Bao Nguyen, John R Smith, "Multimedia Analytics: Modality Classification and Case-Based Retrieval tasks of ImageCLEF2012", *ImageCLEF, Medical Image Retrieval Workshop*, 2012. Ranked #1 in Medical Image Modality Classification Task

34. **Michele Merler** and John Kender, "Selecting the Best Faces to Index Presentation Videos", *ACM Multimedia*, 2011

35. **Michele Merler**, "Analysis, indexing and visualization of presentation videos", *ACM Multimedia*, 2011

36. Matthew Hill, Gang Hua, Apostol Natsev, John R. Smith, Lexing Xie, Bert Huang, **Michele Merler**, Hua Ouyang and Mingyuan Zhou, "IBM Research TRECVID-2010 Video Copy Detection and Multimedia Event Detection System", *NIST TRECVID Workshop*, 2010.

37. Apostol Natsev, Matthew Hill, John R. Smith, Lexing Xie, Rong Yan, Shenghua Bao, Dong Wang, **Michele Merler** and Yi Zhang, "IBM research TRECVID-2009 video retrieval system", *NIST TRECVID Workshop*, 2009.

38. **Michele Merler** and John Kender, "Semantic Keyword Extraction via Adaptive Text Binarization of Unstructured Unsourced Video", *IEEE Conf. on Image Processing* (ICIP), 2009

39. Rong Yan, Marc-Olivier Fleury, **Michele Merler**, Apostol Natsev and John R. Smith, "Large-Scale Multimedia Semantic Concept Modeling using Robust Subspace Bagging and Map-Reduce", *ACM Multimedia Workshop LS-MMRM*, 2009

40. **Michele Merler**, Rong Yan and John R. Smith, "Imbalanced RankBoost for Efficiently Ranking Large-Scale Image/Video Collections", *IEEE Conference Computer Vision and Pattern Recognition* (CVPR) 2009.

41. Jane Chang, **Michele Merler**, Paul Natsev, John R Smith, "IBM Content Based Copy Detection System for TRECVID 2009". *NIST TRECVID Workshop*, 2009. Ranked #1 on Content Based Copy Detection Task

42. Apostol Natsev, Wei Jiang, **Michele Merler**, John Smith, Jelena Tesic, Lexing Xie, Rong Yan, "IBM research TRECVID-2008 video retrieval system", *NIST TRECVID Workshop*, 2008.

43. **Michele Merler,** Carolina Galleguillos and Serge Belongie, "Recognizing Groceries *in situ* Using *in vitro* Training Data", *SLAM Workshop @CVPR*, 2007

PATENTS AND APPLICATIONS

1. *US Patent App. 18/351,620* Mono-lingual language models using parallel data, 2025
2. *US Patent App. 18/160,301* Entity standardization for application modernization, 2024
3. *US Patent App. 18/071,911* Adaptable and explainable application modernization disposition, 2024
4. *US Patent App. 17/977,*880 Attribute-based calibration for machine learning, 2024
5. *US Patent App. 17/936,519* AI System and Method for Automatic Analog Gauge Reading, 2024
6. *US Patent App. 18/048,975* Oblique Image Rectification, 2024
7. *US Patent App. 17/935,198* Knowledge expansion for improving machine learning, 2024
8. *US Patent 11,941,038* Transparent and controllable topic modeling, 2024
9. US Patent App 17/670,617 Neural architecture search of language models using knowledge distillation, 2022
10. *US Patent App 17/075,963* Configuring a neural network using smoothing splines, 2022
11. *US Patent 11,170,270* Automatic generation of content using multimedia, 2021
12. *US Patent 10,595,101* Auto-curation and personalization of sports highlights, 2020
13. *US Patent 10,282,677* Individual and user group attributes discovery and comparison from social media visual content, 2019
14. *US Patent 9,928,448* Image classification utilizing semantic relationships in a classification hierarchy, 2018
15. *US Patent 9,684,852* Systems and methods for inferring gender by fusion of multimodal content, 2017
16. *US Patent 9,177,229* Kalman filter approach to augment object tracking, 2015

PROFESSIONAL ACTIVITY

Associate Editor

IEEE Transactions on Multimedia 2021-2023

Area Chair

ECCV 2024
ICIAP 2019, Brave New Ideas
ACM Multimedia 2017, Multimedia Search and Recommendation
ACM Multimedia 2016, Multimedia Search and Recommendation

Program Chair

International Workshop on Computer Vision in Sports (CVsports) @CVPR 2020-25
Workshop on Fair, Data Efficient and Trusted Computer Vision (FA.DE.TR.CV) @CVPR 2020-25
Second International Workshop on Bias Estimation in Face Analytics (BEFA) @CVPR 2019
First International Workshop on Bias Estimation in Face Analytics (BEFA) @ECCV 2018

Demo Chair
International Conference on MultiMedia Modeling (MMM) 2019

Award Committee Member
Best Paper Award Committee, ACM Multimedia 2017
Grant Reviewing Panelist at National Science Foundation (NSF), IIS Division 2015

Registration Chair
VCIP 2017

Local Organization Chair and Web Chair
ICMR 2016

Guest Editor
Neurocomputing Journal, Special Issue on Advanced Learning for Large-Scale
Heterogeneous Computing, 2016

Co-organizer
Greater New York Area Multimedia and Vision Meeting, 2012 -2014

Technical Program Committee Member and Reviewer
Served since 2008 for major conferences and journals in computer vision/multimedia
Conferences: CVPR, ECCV, ICCV, ACM Multimedia, NeurIPS, AAAI, ICML, ICMR,
FG, ICPR, ICME
Journals: IEEE Transactions on Multimedia, IEEE Transactions on Pattern Analysis and
Machine Intelligence, IEEE Transactions on Image Processing, Computer Vision and Image
Understanding, ACM Transactions on Multimedia Computing, IEEE Transactions on Circuits
and Systems for Video Technology, IPSJ Transactions on Computer Vision and Applications,
Journal of Visual Communication and Image Representation, Neurocomputing, Journal of
Biomedical and Health Informatics

Professional Societies Membership
Member of the IEEE, IEEE Circuits and Systems Society, New York Academy of Sciences

MENTORSHIP (INTERNS)

Jiaqing Yuan (Phd Student, NCSU). Project: contrastive learning on siamese network for entity
standardization, 2022

Aashka Trivedi (MS Student, NYU). Project: NAS-guided language model distillation, 2021

Paul Pritz (PhD Student, Imperial College London). Project: zero-shot learning for IoT device
classification from network traffic data, 2021

Xialong Wang (PhD Student, University of Delaware). Project: face analysis in consumer photos,
2015

Junjie Cai (PhD Student, University of Texas at San Antonio). Project: heterogeneous features
fusion for action recognition in videos, 2014

THESIS COMMITTEE

Adrià Arbués Sangüesa (Universitat Pompeu Fabra, Barcelona) 2021
Chun-Yu (Claire) Tsai (Columbia University), 2017

LANGUAGES

Italian (native), English (fluent), Spanish (intermediate)

OTHER INTERESTS

Soccer, AI Art, Graphic Novels, Philosophy, Light Painting