DANIELA MASSICETI

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Senior Researcher (Machine Learning)
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SUMMARY

I am a multi-disciplinary machine learning (ML) researcher working on "teachable AI" - sytems that can learn on-the-fly from small amounts of noisy, real-world data provided by an end-user. I hold a Ph.D in computer vision, a M.Sc in Neuroscience, and a B.Sc in Electrical & Computer Engineering. My core interests lie in developing ML models that drive interactive, teachable experiences across a range of domains - from accessibility to mixed reality. Some examples include i) my current work on teachable object recognisers for people who are blind, ii) my PhD work on chat bots that can answer questions about an image, and iii) my MSc work on navigation in virtual reality environments using spatial sound. My full research portfolio can be found here. I value working with a multi-disciplinary team, and am dedicated to doing research with real-world impact.

WORK EXPERIENCE

Senior Researcher. Microsoft Research, Sydney *Aug 2022–present*
- Continuing remotely with the Teachable AI Experiences (TaiX) team. Manager: Dr Cecily Morrison MBE

Senior Researcher. Microsoft Research, Cambridge *Apr 2021–Jul 2022*
- Member of Teachable AI Experiences (TaiX) team. Manager: Dr Cecily Morrison MBE
- Machine learning lead in the winning team of the global internal Microsoft Hackathon
- Recipient of the Innovating for the Future Award at the Microsoft Ability Summit

Researcher. Microsoft Research, Cambridge *Feb 2020–Mar 2021*
- Member of Project Tokyo team. Manager: Dr Cecily Morrison MBE
- Collected the ORBIT dataset and open-sourced the ORBIT Teachable Object Recognition benchmark

Postdoctoral Research Fellow. St Edmund's College, University of Cambridge *Apr 2020–Sep 2022*
- Non-stipendiary research fellowship

EDUCATION & SELECTED AWARDS

D.Phil Engineering - Machine Learning (awarded with no corrections), University of Oxford *2015–2019*
- Thesis: "*Computer Vision & Natural Language Processing for People with Vision Impairment*"
- *Supervisors*: Prof. Philip H.S. Torr, Dr Stephen Hicks. *Examiners*: Prof. Andrew Zisserman, Prof. Kristen Grauman.
- Bronze Engineering Award at *STEM4Britain* (awarded by UK Parliament House of Commons) (*2018*)
- Winner of University of Oxford Tri-Innovate Competition (start-up pitch competition) (*2017*)

M.Sc Neuroscience (with distinction), University of Oxford *2014–2015*
- Research project w Prof. Rafal Bogacz – *"Modelling Parkinson's Disease tremor with networks of weakly-coupled oscillators"*
- Research project w Dr Stephen Hicks – *"Sonic Vision: 3D visual-to-audio mappings for non-sighted navigation"*

B.Sc Engineering - Electrical & Computer (cum laude), University of Cape Town *2010–2014*
- With Prof. Fred Nicolls – *"Occluded body pose estimation and reconstruction of bed-bound patients for hospital monitoring"*
- Best final year thesis (Siemens Prize) and finalist in SAIEE National Student Project Competition (*2013*)
- Top final year B.Sc Engineering gradudate (Engineering Council of South Africa medal; *2013*)
- Top 4^{th}, 3^{rd} & 2^{nd}-year student in Engineering faculty (*2013, 2012, 2011*)
- Top 4^{th}, 3^{rd} & 2^{nd}-year student in B.Sc Electrical & Computer Engineering (*2013, 2012, 2011*)
- UCT Engineering Faculty Dean's Merit List ($\geq$ 75% average) (*2010–2013*)
- Golden Key International Honours Society (top academic 15% at UCT) (*2010–2013*)

National Senior Certificate (IEB South Africa), Holy Rosary School, Johannesburg *1996–2009*
- Within top 50 Year 12 students nationally (top 5% in $\geq$ 6 IEB subjects across South Africa) (*2009*)
- Deputy Head Girl, Dux Scholar, School Honours (all-round academic, sporting and cultural excellence) (2009)

INTERNSHIP/CONSULTANCY POSITIONS

Machine Learning Intern, Microsoft Research, Cambridge *June–Dec 2019*

- Developed machine learning models which learn to recognise objects after only seeing a few examples (few-shot recognition)
- Contact: Dr Cecily Morrison MBE - cecilym@microsoft.com

Machine Learning Intern, OxSight Ltd *Nov 2018*

- Developed a machine learning model for predicting which images regions are salient for OxSight's smart-spectacles
- Contact: Dr Stephen Hicks - stephen.hicks@oxsight.co.uk

Machine Learning Consultant, London Vision Clinic *May–July 2018*

- Consulted on machine learning methods for automatic keratoconus prediction from retinal scans
- Contact: Dr Dan Reinstein - dzr@londonvisionclinic.com

Visiting Student, Computer Vision Lab Dresden (CVLD), Technische Universität Dresden *Apr 2015*

- Compared methods for image-based camera relocalisation using random forests and neural networks
- The project resulted in a paper which was accepted and published in ICRA 2017
- Contact: Prof Carsten Rother - carsten.rother@iwr.uni-heidelberg.de

RESEARCH

Selected Publications. See Google Scholar for full list

1. Wang J., Lukasiewicz, T., **Massiceti, D.**, Hu, X., Pavlovic, V., Neophytou, A., 2022. NP-Match: When Neural Processes meet Semi-Supervised Learning. In 2022 International Conference on Machine Learning (ICML).
2. Bronskill, J.*, **Massiceti, D.***, Patacchiola, M.*, Hofmann, K., Nowozin, S., Turner, R.E., 2021. *Memory Efficient Meta-Learning with Large Images*. In 2021 Neural Information Processing Systems (NeurIPS).
3. **Massiceti, D.**, Zintgraf, L., Bronskill, J., Theodorou, L., Harris, M.T., Cutrell, E., Morrison, C., Hofmann, K. and Stumpf, S., 2021. *ORBIT: A Real-World Few-Shot Dataset for Teachable Object Recognition*. In 2021 IEEE International Conference on Computer Vision (ICCV).
4. Theodorou, L., **Massiceti, D.**, Zintgraf, L., Stumpf, S. , Morrison, C., Cutrell, E., Harris, M. T. and Hofmann, K, 2021. *Disability-first Dataset Creation: Lessons from Constructing a Dataset for Teachable Object Recognition with Blind and Low Vision Data Collectors*. In 2021 ACM Conference on Computers and Accessibility (ASSETS).
5. Grayson, M., Thieme, A., Marques, R., **Massiceti, D.**, Cutrell, E., Morrison, C., 2020. *A Dynamic AI System for Extending the Capabilities of Blind People*. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA).
6. **Massiceti, D.***, Dokania, P.K.*, Siddharth, N.* and Torr, P.H.S., 2018. *Visual Dialogue without Vision or Dialogue*. In 2018 Conference on Neural Information Processing Systems (NeurIPS) [Critiquing & Correcting Trends in ML Workshop].
7. **Massiceti, D.**, Siddharth, N., Dokania, P.K. and Torr, P.H.S., 2018. *FlipDial: A Generative Model for Two-Way Visual Dialogue*. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR). [accepted as oral]
8. **Massiceti, D.**, Hicks, S.L. and van Rheede, J.J., 2018. *Stereosonic Vision: exploring visual-to-auditory sensory substitution mappings in an immersive virtual reality navigation paradigm*. PLOS ONE 13(7): e0199389.
9. Hou, Q*, **Massiceti, D.***, Dokania, P.K., Wei, Y., Cheng, M.M. and Torr, P.H.S., 2017. *Bottom-up top-down cues for weakly-supervised semantic segmentation*. In 2017 International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR).
10. **Massiceti, D.**, Krull, A., Brachmann, E., Rother, C. and Torr, P.H.S., 2017. *Random forests versus Neural Networks - What's best for camera localization?*. In 2017 IEEE International Conference on Robotics and Automation (ICRA).

Patents

- On an innovation in few-shot learning applied to a metaverse application [under submission, commercially sensitive]

Selected Presentations

- Panel Discussion, *Pursuing a Resilient and Sustainable Global Society* – Microsoft Research 30th Anniversary Panel Series on Generations of Inspirational and Impactful Research *Dec 2021*

– Sponsor Talk, *Advancing Real-world Few-shot Learning with the ORBIT Dataset* – WiML workshop, NeurIPS *Dec 2021*
– Invited Talk, *Using Few-shot Learning to Realize Teachable AI Systems* – Microsoft Research Summit *Oct 2021*
– Invited Talk, *A Real-World Few-Shot Dataset for Teachable Object Recognition* – VizWiz workshop, CVPR *Jun 2021*
– Guest Lecture, *An Introduction to Dataset Bias* – Department of Computer Science, University of Cambridge *Feb 2020*
– Student Talk, *A Generative Model for Visual Dialogue* – OxBridge Women in Computer Science Conference *Mar 2018*
– Invited Talk, *Teaching Computers to Chat* – ATOM Science Society *Aug 2017*

SELECTED SCHOLARSHIPS & GRANTS

– Pembroke College Senior Common Room (SCR) Senior Scholarship *2018–2019*
– Facebook AI Research *ParlAI* Grant *2017–2019*
– Skye Foundation Scholarship, and University of Oxford Engineering Science Departmental Scholarship *2015–2019*
– Clarendon Fund Scholarship *2014–2015*
– University of Cape Town Engineering Faculty Scholarship *2011–2013*
– Klaus-Jurgen Bathe Scholarship *2012–2013*
– University of Cape Town Engineering Faculty Entrance Scholarship, and Harry Allschwang Grant *2010*

LEADERSHIP

Organising committee member of the *VizWiz workshop* *2022–present*
– VizWiz is an annual workshop at CVPR on computer vision research/technologies for the blind/low-vision community
– I launched the ORBIT Few-Shot Object Recognition Challenge in 2022, a new ML competition at the workshop

Organising committee member of the *Deep Learning Indaba* *2017–present*
– The Indaba is a globally-recognised community for African inclusion in machine learning and artificial intelligence
– I co-organised the Indaba machine learning summer school in 2018 & 2019
– I co-founded & lead the Mentorship Programme in 2020 & 2021, facilitating 200+ mentorship sessions for African students

Industry officer of University of Oxford *Women in Computer Science* *2018–2019*
– I engaged with society's industry partners (including Google, DeepMind, Facebook, Bloomberg, Microsoft, and others)
– I coordinated termly office visits, technical talks, and coding and interview preparation workshops

Committee member of University of Oxford *Women in Engineering* *2016–2019*
– I coordinated the 1st Women in Engineering Research Symposium in May 2018

President of Middle Common Room (MCR), Pembroke College *2017*
– I was elected to represent the Pembroke College graduate body (350 members) in the College's Governing Body Committee
– I introduced per-student subsidies for welfare support, extra-curricular and academic activity

Treasurer and vice president of Middle Common Room (MCR), Pembroke College *2015–2017*
– I managed an annual cash flow of £40,000-£50,000, and acquired £4000+ funding for academic and cultural events
– I was a member of Pembroke College Finance & Planning Committee and Student Development Committee

EXTRA-CURRICULAR

Entrepreneurship
– I began a web-design company for business/personal website development *2013–present*
– I won a start-up competition at University of Oxford with an assistive tool idea for visually-impaired people *2017*

Outreach
– I mentored 1 student in the Oxford Engineering, Science and Technology (OxFEST) Mentorship Scheme *2018–2019*
– I mentored 4 students in the Pembroke MCR/JCR Mentorship Scheme *2016–2018*
– I volunteered 100+ hours at local orphanages, HIV/Aids homes and hospitals *2009–2013*
– I tutored a class of high-school students from a rural South African school in Mathematics, Biology and Physics *2013*

REFERENCES ON REQUEST