DANIELA MASSICETI

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RESEARCH INTERESTS

- Few-shot/meta-learning applied to computer vision tasks, model robustness to real-world image/video data.
- Model explainability and transparency for human-in-the-loop systems.
- Assistive technologies for people with disabilities, primarily blind/low-vision.

WORK EXPERIENCE

Senior Researcher. Microsoft Research, Cambridge *Apr 2021–present*
- Project Tokyo team in Future of Work theme. Manager: Dr Cecily Morrison MBE

Postdoctoral Research Fellow. St Edmund's College, Cambridge *Apr 2020–present*
- 3-year non-stipendiary research fellowship

Researcher. Microsoft Research, Cambridge *Feb 2020–Mar 2021*
- Project Tokyo team in Future of Work theme. Manager: Dr Cecily Morrison MBE

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*"
- *Examiners*: Prof. Andrew Zisserman, Prof. Kristen Grauman
- *Supervisors*: Prof. Philip H.S. Torr, Dr Stephen Hicks
- 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*
- With Prof. Rafal Bogacz – *"Modelling Parkinson's Disease tremor with networks of weakly-coupled oscillators"*
- With 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"*
- Siemens Prize (best final year thesis) and finalist in SAIEE National Student Project Competition (*2013*)
- Engineering Council of South Africa (ECSA) medal - top final year B.Sc(Eng) graduate (*2013*)
- Cape Town City Gold, Silver & Bronze medal (top 4^{th}, 3^{rd} & 2^{nd} year student in Engineering faculty) (*2013, 2012, 2011*)
- Class medal (top 4^{th}, 3^{rd} & 2^{nd} year student in 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*)
- Rochester House (UCT residence) top 2^{nd} year student and top overall student (*2011*)

National Senior Certificate (IEB South Africa), Holy Rosary School, Johannesburg *1996–2009*
- Within Independent Examinations Board Top 50 Matriculants (top 5% in $\geq$ 6 subjects across South Africa) (*2009*)
- Deputy Head Girl and Dux Scholar at Holy Rosary School (*2009*)
- Holy Rosary School Honours (all-round academic, sporting and cultural excellence) (2009)
- Public Speaking & Academic full colours. Swimming & Service to the Community half colours (*2008, 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

SELECTED SCHOLARSHIPS & GRANTS

– Pembroke College Senior Common Room (SCR) Senior Scholarship *2018–2019*
– Facebook AI Research *ParlAI* Grant *2017–2019*
– Winner of Tri-Innovate (University of Oxford innovation competition) *2017*
– 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*
– *ItalDev* South African-Italian Bursary [declined] *2010*

RESEARCH

Selected Publications. See Google Scholar for full list

– 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).
– **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).
– 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).
– **Massiceti, D.**, Kulharia, V., Dokania, P.K., Siddharth, N. and Torr, P.H.S., 2020. *A Revised Generative Evaluation of Visual Dialogue*. arXiv preprint arXiv:2004.09272.
– **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].
– **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]
– **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.
– 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).
– **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 personalisation [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* – Responsible AI track, Microsoft Research Summit (Microsoft Research's flagship annual event) *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*
- Student Talk, *Seeing with Sound: Sensory Substitution for Navigation* – Oxford Vision Group *Oct 2015*

LEADERSHIP

Committee member of *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, 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 operating cash flow of £40,000-£50,000
- I acquired over £4000 in funding for MCR academic, sporting, cultural and social 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*

Sporting

- I was on the University of Oxford 2nd swimming team *2016–2018*

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 South African rural school in Mathematics, Biology and Physics *2013*

REFERENCES

- **Dr Cecily Morrison MBE** [Principal Research Manager, Microsoft Research] – cecilym@microsoft.com/+441223479700
- **Prof. Philip H.S. Torr** [Professor of Engineering Science, University of Oxford/Chief Scientific Advisor, FiveAI/Royal Academy of Engineering Fellow] – philip.torr@eng.ox.ac.uk/+441865283059
- **Dr Stephen Hicks** [Director of OxSight] – stephen.hicks@oxsight.co.uk/+441865234635