

# Michael Wray

*Lecturer in Computer Vision*

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## CURRENT APPOINTMENT

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**Lecturer in Computer Vision (Grade J)**  
*University of Bristol*

March 2022 – Current  
*Bristol, UK*

## PREVIOUS APPOINTMENTS

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**Post-Doctoral Researcher in Computer Vision**  
*University of Bristol*

Dec. 2019 – March 2022  
*Bristol, UK*

**Teaching Associate**  
*University of Bristol*

Sept. 2018 – Sept. 2019  
*Bristol, UK*

- COMS21202: Lead the restructure of labs and coursework for 2<sup>nd</sup> year Computer Science Unit Symbols, Patterns and Signals.

**Teaching Assistant**  
*University of Bristol*

Sept. 2015 – Sept. 2019  
*Bristol, UK*

Data Structures and Algorithms (Y2) Symbols, Patterns and Signals (Y2) Computer Graphics (Y3)  
Image Processing and Computer Vision (Y3) Applied Deep Learning (Y4)

## ACADEMIC QUALIFICATIONS

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**PhD in Computer Vision**  
*University of Bristol*

Sept. 2015 – Sept. 2019  
*Bristol, UK*

- Thesis Title: Verbs and Me—An Investigation into Verbs as Labels for Action Recognition in Video Understanding.

**MEng in Computer Science**  
*University of Bristol*

Sept. 2011 – Sept. 2015  
*Bristol, UK*

- Degree Classification: First Class Honours
- Dissertation Title: Generating Object Proposals for Wearable Visual Sensors.

## AWARDS AND HONOURS

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**European Laboratory for Learning and Intelligent Systems (ELLIS) Member** *Accepted March 2022. Nominated by Jan Van Gemert (TU Delft) and Giovanni Maria Farinella (University of Catania)*

**Outstanding Reviewer** *In all major Computer Vision Conferences: ECCV 2022, ICCV 2021, CVPR 2021, BMVC 2020*

**Best Poster Award (Honourable Mention)** *British Machine Vision Association Summer School, Swansea 2016*

## TEACHING AND RELATED ADMIN

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I teach on 5 units as Unit Director and 1 unit as a lecturer with a mixture of undergraduate teaching covering years 2, 3, and 4. I have updated the teaching for all of the units I am a part of, introducing new focuses of research-rich learning, video lecture content, and support sessions to improve the teaching experience for students. I consistently receive excellent feedback for my lecturing, teaching style, and organisation for my units.

### **Unit Director: Applied Deep Learning COMSM0045**

2023 – Current

- 66 Students 2022/23, 42 students 2023/24.
- 4th Year Undergraduate Optional Unit.
- Responsibilities: 50% teaching, 50% exam, 100% Coursework, and Unit Director Admin.
- Examined Coursework and written exam.
- I continuously update lecture/lab material and lab/coursework content to ensure up to date teaching delivery for students wishing to work in this area. This has included 2 new lectures and 1 new lab since I joined as UD.
- I introduced several teaching and assessment methods: **Hands-on AI tooling**, **Modular Extensions**, and **Practical Exam Questions** (see below).

### **Lecturer: Computer Systems A COMS20008**

2023 – Current

- 165 Students 2022/23, 148 students 2023/24.
- 2nd Year Undergraduate Core Unit.
- Responsibilities: 25% teaching, 25% exam, 25% Coursework.
- Examined Coursework and multiple choice exam.
- I teach 60% of the Distributed Systems side of the unit through recorded lectures and labs.
- I introduced a new lecture to help with the Distributed Component of the coursework.
- I have created high quality lecture videos that are engaging for students to watch and learn from due to the asynchronous nature of the unit, introduced **Cliffhanger questions** (see below) for this purpose.

### **Unit Director 23/24: Individual Project Units**

2023 – Current

*Deputy Unit Director 22/23*

- COMS30044, COMS30045, COMSM0052, COMSM0142.
- 157 Students 2022/23, 167 students 2023/24.
- 3rd/4th Year Undergraduate Core Unit.
- Capstone project unit
- 100% coursework
- Dissertation and viva
- I am the unit director for the individual project units and oversee admin tasks such as matching of students/project/supervisors, marking deadlines and viva dates, ethics training, organisation of research skill workshops.
- I introduced a new ethics lecture and quiz, resulted in a reduction of ethical oversights for 22/23.
- I have organised two writing retreats new to the course to help with student's time management, planning, and writing with good feedback and attendance.
- I organised for two years in a row a Poster Day for students to received formative feedback and showcase their work to other undergraduate students/staff. This was the first time this was run since before the pandemic requiring new policies and expectations for staff and students.

- I became the acting Unit Director during the 2023 Marking and Assessment Boycott. I stepped up and lead the marking process during the tumultuous time within moderation panels and administering emergency markers over the reassessment period.

## Innovative Teaching and Assessments

- **Hands-on AI Tooling:** Motivated the Deep Learning course through the usage of AI tooling during teaching, including ChatGPT, Stable Diffusion (image generation), and AI or Fake tool. Students found the lectures easier to engage and follow with these examples.
- **Modular Extensions:** For the coursework, students were given modular extensions to focus on as they saw fit—they could pick one or more extensions from a list or go further into the literature to choose an extension. TAs were trained and briefed towards providing guidance for the extensions to help students throughout the coursework period.
- **Practical Exam Questions:** I included applied questions to better tie in the exam to the labs and match learning objectives with the restructure of units into exam only. Students have provided good feedback to these essay style questions.
- **Cliffhanger Questions:** To keep video lectures engaging, questions were provided at the end of each video with the answer feeding forward into the next lecture topic. Students enjoyed the added structure to the course as each lecture tied into the next lecture and asked them to consider the wider area.

## Postgraduate Advising

- Sam Pollard: MEng, PhD, 2023–Current *primary supervisor*
- Adriano Fragomeni: PhD, 2020–Current (w/ Dima Damen)
- Kevin Flanagan: PhD, 2021–Current (w/ Dima Damen)
- Shijia Feng: PhD, 2022–Current (w/ Walterio Mayol Cuevas)
- Beth Pearson: PhD, 2023–Current (w/ Martha Lewis)

## Professional Development

I have completed PGCAP Unit 1 with a distinction in 2023 and currently undertaking PGCAP unit 2. I also attended/enrolled on BILT workshops including AI and Assessment, Group Assessment, Personal Tutoring, and Research Supervision Courses.

## Collaborative Teaching Projects

In collaboration with the British Machine Vision Association, a national forum for researchers in machine vision, image processing, and pattern recognition within the UK, I have been invited to give a 90 minute lecture on egocentric vision. This event is attended by approximately 60 1st year PhD students from UK and abroad.

## RESEARCH AND RELATED ADMIN

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I am currently supervising 6 PhD supervisors, with 1 student as the primary supervisor. I have three papers at CVPR, Computer Vision’s premier conference (note that in Computer Vision conferences are ranked as high as the top journals). Two of these were a collaboration with Meta and 15 Universities worldwide. I additionally have 3 papers across Computer Vision’s and Machine Learning’s top conferences. Due to my expertise in this area, I have been an area chair for 3 conferences, have presented a lecture at the British Machine Vision Association’s Summer School for 3 years in a row, and have been invited as an external examiner for 2 PhD Theses. Orcid ID: <https://orcid.org/0000-0001-5918-9029>

## Publications

### Academic Journal Papers (Refereed)

- Damen, D., Doughty, H., Farinella, G.M., Furnari, A., Kazakos, E., Ma, J., Moltisanti, D., Munro, J., Perrett, T., Price, W. and Wray, M., 2022. Rescaling egocentric vision: Collection, pipeline and challenges for epic-kitchens-100. *International Journal of Computer Vision*, 1-23. Springer International Publishing.
- Damen, D., Doughty, H., Farinella, G.M., Fidler, S., Furnari, A., Kazakos, E., Moltisanti, D., Munro, J., Perrett, T., Price, W. and Wray, M., 2020. The epic-kitchens dataset: Collection, challenges and baselines. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 43(11), 4125-4141. Institute of Electrical and Electronics Engineers.

### Conference Contributions (Refereed)

- Flanagan, K., Damen, D. and Wray, M., 2023. Learning temporal sentence grounding from narrated egovideos. In *Proceedings British Machine Vision Conference (BMVC)*, 34, 2023. British Machine Vision Association.
- Lin, K.Q., Wang, J., Soldan, M., Wray, M., Yan, R., Xu, E.Z., Gao, D., Tu, R.C., Zhao, W., Kong, W. and Cai, C., 2022. Egocentric video-language pretraining. In *Proceedings Advances in Neural Information Processing Systems*, 35, 7575-7586. Curran Associates.
- Fragomeni, A., Wray, M. and Damen, D., 2022. ConTra:(Con) text (Tra) nsformer for cross-modal video retrieval. In *Proceedings of the Asian Conference on Computer Vision*, 16, 3481-3499. Springer International Publishing.
- Grauman, K., Westbury, A., Byrne, E., Chavis, Z., Furnari, A., Girdhar, R., Hamburger, J., Jiang, H., Liu, M., Liu, X. and Martin, M. ... and Wray, M. and ..., 2022. Ego4d: Around the world in 3,000 hours of egocentric video. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 35, 18995-19012 Institute of Electrical and Electronics Engineers.
- Wray, M., Doughty, H. and Damen, D., 2021. On semantic similarity in video retrieval. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 34, 3650-3660. Institute of Electrical and Electronics Engineers.
- Wray, M. and Damen, D., 2019. Learning visual actions using multiple verb-only labels. In *Proceedings of the British Machine Vision Conference (BMVC)*, 30, 2019. British Machine Vision Association.
- Wray, M., Larlus, D., Csurka, G. and Damen, D., 2019. Fine-grained action retrieval through multiple parts-of-speech embeddings. In *Proceedings of the IEEE/CVF international conference on computer vision*, 17, 450-459. Institute of Electrical and Electronics Engineers.
- Damen, D., Doughty, H., Farinella, G.M., Fidler, S., Furnari, A., Kazakos, E., Moltisanti, D., Munro, J., Perrett, T., Price, W. and Wray, M., 2018. Scaling egocentric vision: the epic-kitchens dataset. In *Proceedings of the European conference on computer vision (ECCV)*, 15, 720-736. Springer International Publishing
- Moltisanti, D., Wray, M., Mayol-Cuevas, W. and Damen, D., 2017. Trespassing the boundaries: Labeling temporal bounds for object interactions in egocentric video. In *Proceedings of the IEEE International Conference on Computer Vision*, 16, (pp. 2886-2894). Institute of Electrical and Electronics Engineers.
- Wray, M., Moltisanti, D., Mayol-Cuevas, W. and Damen, D., 2016. Sembed: semantic embedding of egocentric action videos. In *Computer Vision—ECCV 2016 Workshops: Amsterdam, The Netherlands, October 8-10 and 15-16, 2016, Proceedings, Part I 14* 532-545. Springer International Publishing.

### Forthcoming Publications

#### Academic Journal Papers (Refereed)

- Grauman, K., Westbury, A., Byrne, E., Chavis, Z., Furnari, A., Girdhar, R., Hamburger, J., Jiang, H., Liu, M., Liu, X. and Martin, M. ... and Wray, M. and ..., 2022. Ego4d: Around the world in 3,000 hours of egocentric video. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2024. Institute of Electrical and Electronics Engineers.

#### Conference Contributions (Refereed)

- Souček, T., Damen, D., Wray, M., Laptev, I. and Sivic, J., 2024. Genhowto: Learning to generate actions and state transformations from instructional videos. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 37, 2024. Institute of Electrical and Electronics Engineers.
- Grauman, K., Westbury, A., Torresani, L., Kitani, K., Malik, J., Afouras, T., Ashutosh, K., Baiyya, V., Bansal, S., Boote, B. and Byrne, E. and ... and Wray, M., 2024. Ego-exo4d: Understanding skilled human activity from first-and third-person perspectives. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 37, 2024. Institute of Electrical and Electronics Engineers.

## Indications of External Recognition

- Associate Editor Special Issue on Text Multimedia Retrieval: retrieving multimedia data by means of natural language 2024.
- Member of European Laboratory for Learning and Intelligent Systems 2022–Current
- Area Chair of major Computer Vision Conferences: CVPR 2023, CVPR2024, ECCV 2024.
- Invited Talk: King’s College London 10th April 2024.
- Internal PhD Examiner: Ruixiong Wang, 2024, Mengjie Zhou, 2024.
- External PhD Examiner: Edward Fish, University of Surrey, 2024.
- External PhD Examiner: Ivan Rodin, University of Catania, 2023.
- External MScR Examiner: Jack Tsangou, University of Edinburgh 2023.
- Invited Research Lecture: University of Catania, 2022

## Future Plans

Building upon work that has been accepted at BMVC in 2023 (Learning Temporal Sentence Grounding from Narrated EgoVideos) and work currently under review, I will be submitting my EPSRC New Investigator Award during Summer 2024, 10% PI.

## Related Administration

- **Chair of BMVA Research Symposium Jan 2024** Organising chair of a one-day research event on Vision and Language Understanding in Collaboration with the BMVA of speakers from UK and Europe with 90 attendees from UK and Europe. This was the second such event since the pandemic and the first event that brought together the Vision and Language research community in UK and Europe.
- **Collaboration with Project ARIA from Meta** I am Co-I working with the Project ARIA research team within Meta’s Reality Labs on the Project ARIA research devices to record new datasets for egocentric vision. These include charitable donations of 18 devices and £XXXX.
- **Charitable Donation from Google DeepMind** I received a charitable donation as an unrestricted gift from Google Deepmind for continuing work and data collection for the EPIC-Kitchens Dataset.

## ACADEMIC LEADERSHIP AND CITIZENSHIP

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- Member of the Advanced Computer Research Centre High Performance Computer Executive since 2023.
- Member of Working Group for School of Computer Science Research Leave since 2024.
- Area Chair for major Computer Vision Conferences: CVPR 2023–2024, ECCV2024
- Regular Reviewer of major Computer Vision Conferences: CVPR 2019–2022, NeurIPS 2023, ICCV 2021–2023, ECCV 2022, ACCV 2020–2022, BMVC 2019–2023, WACV 2021–2023.
- Regular Reviewer of major Computer Vision Journals: TPAMI, IJCV, TCSVT, Pattern Recognition.
- Co-organiser of Staff/Student Board Game Sessions to promote work/balance with students.

- Co-organiser of workshops at major Computer Vision Conferences: What is Next in Video Understanding alongside CVPR 2024; Egocentric Perception, Interaction and Computing alongside ICCV 2021 (lead), CVPR 2021 (lead), and ECCV 2020; Joint Ego4D and EPIC workshop alongside CVPR 2022 and CVPR 2023; and Ego4D alongside ECCV 2022.
- Academic lead of the Formula Student-AI team at University of Bristol—creating workshops and teaching students across the Engineering faculty fundamentals of Machine Learning and AI.
- Always meet internal marking deadlines for coursework and exam marking, liaising frequently with the school office as required.
- Volunteer talks on other units, including Intro to Computer Science for the MSc Computer Science Conversion.
- Gave a keynote talk on Data Collection at the Open Access Databases Conference at University of Bristol 2023.
- Gave a keynote talk on my experience of going from an Access to Bristol Student to a Lecturer in 2022.