

Christopher Clarke | Curriculum Vitae

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OVERVIEW

I am a postdoctoral researcher in Ubiquitous Computing and Mixed Reality at Lancaster University. My research is directed at interaction techniques and interfaces using novel input methods, including body movement and eye tracking. My research goals are to methodically research, develop, and evaluate novel and compelling interaction techniques and systems that impact our everyday lives.

HIGHLIGHTS

- 4+ years of research experience in Human-Computer Interaction (HCI) and Ubiquitous Computing.
- Research projects include novel interaction techniques, computer vision-based gestural interaction, eye tracking, wearable technologies, and mixed reality.
- Broad publication record in premiere international conferences such as CHI, UIST, UbiComp/IMWUT, and TOCHI.
- Teaching and supervision experience through lectures in HCI, Data Science, and Computer Vision; mentoring and supervising of undergraduate, postgraduate, and Erasmus projects and theses, and Associate Fellow of the Higher Education Academy (AFHEA).
- Awarded EPSRC Doctoral Prize for postdoctoral research based on expanding work done during my PhD.
- TOCHI'17 best paper award, and ETRA'20 best paper honourable mention for full papers, master thesis award, student of the year, and nominated for several PhD thesis prizes (SIGCHI and BCS).
- Reviewer for a wide range of HCI conferences, books and journals, and program committee member for conferences (ETRA'19, NordiCHI'20) and demo tracks (MM'19).
- Co-authored successful industry grant proposals worth ≈£1.1 million funded by the UK's Small Business Research Initiative (SBRI).

PROFESSIONAL EXPERIENCE

- Jan. 2020 – Present **EPSRC Doctoral Prize Researcher**
School of Computing and Communications, Lancaster University, UK
- Working in Dr Steven Houben's group on mixed reality interaction
 - Fully funded award from UK Engineering and Physical Science Research Council
- May 2019 – August 2019 **Research Intern**
FX Palo Alto Laboratory, Palo Alto, USA
- Worked on state-of-the-art gesture-based video applications
 - Winner of the annual FXPAL hackathon
- Jan. 2014 – Sept. 2015 **Project Co-ordinator**
Veraz Ltd, Lancaster, UK
- Co-authored grant proposals for SBRI Phase 1 and 3 funding, resulting in successful projects worth ≈£1.1 million
 - Managed the productisation of a novel touch monitoring hand hygiene system, culminating in a trial at a leading Manchester hospital (SBRI Phase 3), and the development of a novel person-to-person touch monitoring system (SBRI Phase 1)
- Jan. 2014 – July 2014 **Research Assistant**
Intelligent Systems Research Group, Lancaster University, UK
- Developed two autonomous systems for detecting moving objects using a camera on a moving platform, one implemented on the Android smartphone platform and the other on a low-powered device mounted to a UAV
- Oct. 2012 – Jan. 2014 **Research Engineer**
Veraz Ltd, Lancaster, UK

- Researched novel indoor positioning technology and algorithms, and was project manager for a Food Standards Agency (FSA) funded research project on the deployment of a novel touch monitoring hand hygiene system

EDUCATION

- Oct. 2015 – Jun. 2020 **PhD in Computer Science**
 School of Computing and Communications, Lancaster University, UK
- *"Dynamic Motion Coupling of Body Movement for Input Control"* supervised by Prof. Hans Gellersen
 - Fully funded award from UK Engineering and Physical Science Research Council
 - Investigating motion correlation techniques using computer vision and commodity sensing devices to enable user input with any body part or object
- Oct. 2013 – Sept. 2014 **MSc Computer Science**
 School of Computing and Communications, Lancaster University, UK
- Distinction (Average 82%)
 - Master thesis: *"Autonomous Object Detection and Behaviour Analysis in Video Streams"* supervised by Prof. Plamen Angelov
 - Best Overall Students Performance award and Best MSc Computer Science Project award
- Oct. 2009 – June 2012 **BEng (Hons) Computer Systems Engineering**
 Engineering Department, Lancaster University, UK
- First Class (Average 85%)
 - Bachelor thesis: *"Neural Network Approach for the Analysis and Design of Photonic Crystal Cavities"* supervised by Dr. Rosa Letizia
 - Pilkington Award for outstanding performance at Part I

RESEARCH PUBLICATIONS

In my area peer-reviewed conference publications are the primary outlet for current research. ACM CHI and ACM UIST are the premier conference venues for Human Computer Interaction (HCI) research, ACM TOCHI is the premier journal for HCI. PACM IMWUT (formerly ACM UbiComp) is the premier venue for Ubiquitous Computing. According to Google Scholar I currently have an h-index of 7, with 140 citations in the last 5 years (as of July 2020).

1. **Christopher Clarke**, Doga Cavdir, Patrick Chiu, Laurent Denoue, Don Kimber. 2020. Reactive Video: Adaptive Video Playback Based on User Motion for Supporting Physical Activity. In Proceedings of the 33rd Annual ACM Symposium on User Interface Software and Technology (UIST '20). ACM, New York, NY, USA. **(To be published)**
2. Ludwig Sidenmark, Diako Mardanbegi, Argenis Ramirez Gomez, **Christopher Clarke**, and Hans Gellersen. 2020. BimodalGaze: Seamlessly Refined Pointing with Gaze and Filtered Gestural Head Movement. In Symposium on Eye Tracking Research and Applications (ETRA '20). ACM, New York, NY, USA, Article 8, 1–9.
 DOI: <https://doi.org/10.1145/3379155.3391312> **(Honourable Mention Award)**
3. Ludwig Sidenmark*, **Christopher Clarke***, Xuesong Zhang, Jenny Phu, and Hans Gellersen. 2020. Outline Pursuits: Gaze-assisted Selection of Occluded Objects in Virtual Reality. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). ACM, New York, NY, USA, 1–13.
 DOI: <https://doi.org/10.1145/3313831.3376438> * **denotes equal contribution**
4. Diako Mardanbegi, **Christopher Clarke**, and Hans Gellersen. 2019. Monocular gaze depth estimation using the vestibulo-ocular reflex. In Proceedings of the 11th ACM Symposium on Eye Tracking Research & Applications (ETRA '19). ACM, New York, NY, USA, Article 20, 1–9.
 DOI: <https://doi.org/10.1145/3314111.3319822>
5. **Christopher Clarke** and Hans Gellersen. 2017. MatchPoint: Spontaneous Spatial Coupling of Body Movement for Touchless Pointing. In Proceedings of the 30th Annual ACM Symposium on User Interface Software and Technology (UIST '17). ACM, New York, NY, USA, 179-192.
 DOI: <https://doi.org/10.1145/3126594.3126626>
6. **Christopher Clarke**, Alessio Bellino, Augusto Esteves, and Hans Gellersen. 2017. Remote Control by Body Movement in Synchrony with Orbiting Widgets: an Evaluation of TraceMatch. Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.

(IMWUT), 1, 3, Article 45 (September 2017), 22 pages.

DOI: <https://doi.org/10.1145/3130910>

7. Eduardo Velloso, Marcus Carter, Joshua Newn, Augusto Esteves, **Christopher Clarke**, and Hans Gellersen. 2017. Motion Correlation: Selecting Objects by Matching Their Movement. *ACM Trans. Comput.-Hum. Interact. (TOCHI)*. 24, 3, Article 22 (April 2017), 35 pages. (**Best Paper Award**)
DOI: <https://doi.org/10.1145/3064937>
8. **Christopher Clarke**, Alessio Bellino, Augusto Esteves, Eduardo Velloso, and Hans Gellersen. 2016. TraceMatch: a computer vision technique for user input by tracing of animated controls. In *Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp '16)*. ACM, New York, NY, USA, 298-303.
DOI: <https://doi.org/10.1145/2971648.2971714>
9. Plamen Angelov, Pouria Sadeghi-Tehran, and **Christopher Clarke**. 2017. AURORA: autonomous real-time on-board video analytics. *Neural Computing and Applications* 28, 5 (2017), 855–865.
10. Corina Sas, Scott Challioner, **Christopher Clarke**, Ross Wilson, Alina Coman, Sarah Clinch, Mike Harding, and Nigel Davies. 2015. Self-Defining Memory Cues: Creative Expression and Emotional Meaning. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '15)*. ACM, New York, NY, USA, 2013-2018.
11. **Christopher Clarke**, Plamen Angelov, Majid Yusuf, and Pouria Sadeghi-Tehran. 2014. Sariva: Smartphone app for real-time intelligent video analytics. *Journal of Automation Mobile Robotics and Intelligent Systems* 8, 4 (2014), 15–19.
12. Pouria Sadeghi-Tehran, **Christopher Clarke**, and Plamen Angelov. 2014. A real-time approach for autonomous detection and tracking of moving objects from UAV. In *Evolving and Autonomous Learning Systems (EALS), 2014 IEEE Symposium on*. IEEE, 43–49.

PATENTS PENDING

- A method of effecting control of an electronic device. PCT/GB2018/050584. 2017.

TEACHING ACTIVITY

Co-Supervision

Lancaster University, UK

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| Present | <ul style="list-style-type: none">• Matthew Templeton, Collaborative Session Browsing in Mobile Augmented Reality, <i>EPSRC intern student</i> |
| 2020 | <ul style="list-style-type: none">• Peter Ehrig, Motion Coupling of Earable Devices in Camera View, <i>Erasmus Master's student</i>, |
| 2020 | <ul style="list-style-type: none">• Enikő Harmat, Motion Correlation with Earables and Smartphones, <i>Erasmus Master's student</i> |
| 2019 | <ul style="list-style-type: none">• Jenny Phu, Outline Pursuits: Selection in Virtual Environments, <i>Erasmus Bachelor's student</i> |
| 2019 | <ul style="list-style-type: none">• Xuesong Zhang, Outline Pursuits in Virtual Reality for Selection, <i>Erasmus Master's student</i> |
| 2019 | <ul style="list-style-type: none">• Lisa Norcross, Motion Correlation for Hands-free Smartphone Input, <i>Bachelor's dissertation</i> |
| 2019 | <ul style="list-style-type: none">• Louis Creely, Motion-based Interaction Using a Smartphone for Ubiquitous Interaction, <i>Bachelor's dissertation</i> |

2018 – 2020

Guest lectures

Lancaster University, UK

All lectures involved developing material from scratch.

- ENGR.329 2020 - Computer Vision – Delivered to 3rd year Mechatronics undergraduate cohort
- SCC.022 2020 – Making Sense of Data - Developed original lecture material delivered online, weekly quizzes, and exam questions with short time constraints due to staff absence.
- SCC.202 2018 - Touchless Gestures – Delivered to 2nd year Computing undergraduate cohort

2016 – Present

Professional Development

- Associate Fellowship of the Higher Education Academy (AFHEA) - Associate Teacher Programme, Lancaster University (2019)
- Introduction to Teaching at Lancaster, Lancaster University (2016)
- School of Computing Teaching Assistant Training, Lancaster University (2016)

2015 – 2020

Teaching Assistant

Lancaster University, UK

- Courses taught:

- SCC.110: Software Development (2015/16)
 - SCC.202: Human-Computer Interaction (2016/17, 2017/18 & 2018/19)
 - SCC.205: Social, Ethical and Professional Issues in Computing (2018/19)
- Responsible for supervision of undergraduate lab sessions, creating tutorial material, independently running seminars, and marking of coursework.

PROFESSIONAL ACTIVITY

- 2019 – 2020 **Program committee member**
- NordiCHI 2020 – *Associate Chair*
 - ACM Symposium on Communication by Gaze Interaction (COGAIN) 2020
 - ACM Symposium on Eye Tracking Research & Applications (ETRA) 2019
 - ACM Multimedia 2019 - *Demo track*
- 2020 **Organising committee member**
- UIST 2020 Sustainability co-chair
- 2018 - 2020 **Invited talks**
- "*Reactive Video*", Dance4Healing, California (virtual) (14/07/2020)
 - "*Motion Correlation for Touchless Gestures*", Edinburgh Napier University (16/11/2018)
- 2017 **ACM SIGCHI Summer School on Computational Interaction**
ETH Zürich
- Attended the summer school on computational interaction which focussed on optimization of user interface design, and machine learning & inference for designing transformations from input to useful action
- 2016 – Present **Reviewer of research articles in HCI & UbiComp conferences/journals**
- ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)
 - ACM Annual Symposium on User Interface Software and Technology (UIST)
 - PACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
 - ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)
 - Other ACM Conferences including ISS, DIS, ETRA, TEI, CHI Play, MUM

OUTREACH

- 2019 **Applicant Visit Days (AVD)**
Lancaster University, UK
- Talks to prospective students and parents based on the interactive systems research group, and demonstration of research prototypes
- 2018 **Postgraduate Immersion Event**
Lancaster University, UK
- Introduced potential masters and PhD students to research within the department, and met with students on an individual basis to discuss postgraduate studies
- 2016-2019 **Lab Tours**
Lancaster University, UK
- Provided regular lab tours and inductions to students during open days.

SELECTED MEDIA

- [BBC One North West Tonight](#) – Featured segment on evening TV with interview, 2017
- Have I Got News For You – Missing word round featured MatchPoint news article, 2017
- Steve Wright in the Afternoon, BBC Radio 2 – Mentioned MatchPoint project, 2017

- BBC Radio 5 Live, radio interview on MatchPoint system, 2017
- BBC World Service Radio, radio interview on MatchPoint system, 2017
- BBC Radio Lancashire, radio interview on MatchPoint system, 2017
- BBC Radio Leicester, radio interview on MatchPoint system, 2017
- Radio Deutschlandfunk (Germany), radio interview on MatchPoint system, 2017
- [BBC Click](#) - Control your television with any object (Online video feature and interview), 2017
- [Reuters](#) - Turn your head into a remote control (Online article), 2017
- [New Scientist](#) - How a wave of your coffee cup or spoon could switch TV channels (Online article), 2017
- [Telegraph](#) - End of the TV remote could be nigh as scientists invent technology to change channel using gestures (Online article), 2017
- [Wired](#) - Can't find the remote? Control your TV with your cuppa (Online article), 2017