Curriculum Vitae - Longfei Chen

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1. Record

a) Education:

2015–2020	Doctor of Philosophy, Electrical Engineering (awarded 2020), Kyoto University, Kyoto, Japan Thesis: *Analysis and Modeling of Machine Operation Tasks Using Egocentric Vision*
2011–2014	Master of Engineering, Control Theory and Control Engineering, Sichuan University, Chengdu, China
2007–2011	Bachelor of Engineering, Agricultural Electrification and Automation, Sichuan Agricultural University, Ya'an, China

b) Career and Experience:

05/2026 -	Research Associate, School of Computing Science, University of Glasgow, UK
09/2025 – 06/2026	Visitor, School of Informatics, University of Edinburgh, UK
05/2021–08/2025	Research Associate, School of Informatics, and Advanced Care Research Centre, University of Edinburgh, UK
10/2018–04/2021	Part-time Researcher, Kyoto University, Japan
02–03/2016, 09/2018	Visiting Student, Visual Information Lab, University of Bristol, UK
10/2016–09/2017	Teaching Assistant, Kyoto University, Japan
04/2015–09/2015	Research Student, Kyoto University, Japan
10/2014–04/2015	Half-year break to travel, China
06/2008–09/2008	Volunteer, Sichuan Earthquake Summer Internship, China

2. Research

Selected Publications

Google Scholar (current h-index 5): https://scholar.google.co.uk/citations?hl=en&user=v4iEtbEAAAAJ

1. **Chen Long-fei**, Christopher Lochhead, Robert B. Fisher, Nusa Faric, Jacques Fleuriot, Subramanian Ramamoorthy (2025). Evaluating Personalised Beneficial Interventions in the Daily Lives of Older Adults Using a Camera. *International Conference on AI in Healthcare (AIiH)*, 2025: 131–141.

2. **Chen Long-fei**, Muhammad Ahmed Raza, Craig Innes, Subramanian Ramamoorthy, Robert B. Fisher (2024). Unobtrusive Monitoring of Physical Weakness: A Simulated Approach. *ACM Transactions on Computing for Healthcare* (Accepted to appear). arXiv:2406.10045.

3. **Chen Long-fei**, Muhammad Ahmed Raza, Imran Saied, Tughrul Arslan, Robert B. Fisher (2024). Measuring Changes in Upper Body Movement Due to Fasting Using a Camera. *Sensors*, 24(22): 7242.

4. **Chen Long-fei**, Subramanian Ramamoorthy, Robert B. Fisher. OPPH: A Vision-Based Operator for Measuring Person Body Movements in Healthcare. *12th International Workshop on Assistive Computer Vision and Robotics (@ECCV24)*, pp. 203–217.

5. **Chen Long-fei**, Robert B. Fisher (2024). MISO: Monitoring Inactivity of Single Older Adults at Home using RGB-D Technology. *ACM Transactions on Computing for Healthcare.* doi:10.1145/3674848.

6. **Chen Long-fei**, Yuichi Nakamura, and Kazuaki Kondo (2020). Modeling user behaviors in machine operation tasks for adaptive guidance. *arXiv preprint*, arXiv:2003.03025.

7. **Chen, L.**, Nakamura, Y., Kondo, K., Damen, D., & Mayol-Cuevas, W. W. (2019, May). Hotspots Integrating of Expert and Beginner Experiences of Machine Operations through Egocentric Vision. In *16th International Conference on Machine Vision Applications (MVA)*, pp. 1–6. IEEE.

8. **Chen, L.**, Kondo, K., Nakamura, Y., Damen, D., & Mayol-Cuevas, W. W. (2017, May). Hotspots Detection for Machine Operation in Egocentric Vision. In *15th IAPR International Conference on Machine Vision Applications (MVA)*, pp. 223–226. IEEE.

9. **Chen, L.**, & Xiaomei, Y. (2014, December). A Low-rank Based Robust Video Deblocking Method. In *11th International Computer Conference on Wavelet Active Media Technology and Information Processing (ICCWAMTIP)*, pp. 55–59. IEEE.

Datasets

- Edinburgh Simulated Surgical Tools (RGBD): https://homepages.inf.ed.ac.uk/rbf/SURGICALTOOLS/
  A synthetic dataset with 2D/3D surgical tools for object recognition and pose estimation/registration
- Human MotionLess (HuMoLs): https://groups.inf.ed.ac.uk/vision/DATASETS/HUMOLS/
  A real-world dataset containing human subjects who are motionless, used for motion detection in healthcare purposes (e.g., inactivity or loss of consciousness)

Research Grants

1. Wellcome Institutional Partnership Award, University of Edinburgh. £5k (awarded 02/2024)

2. Moray Endowment Fund, University of Edinburgh. £1.95k (awarded 12/2024)

Technical Skills

Python, PyTorch, MATLAB, C/C++, Swift (iOS), Java (Android), LaTeX,
Jetson Nano, Raspberry Pi, Google Glass, IMU, RGB-D cameras (Kinect, Intel RealSense), Tobii Eye Tracker, 360° cameras (Insta360, Ricoh Theta).

Research Domains

Egocentric vision (computer vision, head-wearable and fixed camera), Action recognition, Temporal modeling, Human behavior analysis, and healthcare applications

2021–2025, Vision-based human physical behavior analysis for health conditions

As a Research Associate at the University of Edinburgh, my research focused on vision-based analysis of human behavior, particularly to support the independent domestic living of older adults. My responsibilities included developing computer vision and machine/deep learning algorithms, deploying edge devices for in-home monitoring, preparing ethics applications, recruiting participants, collecting data on-site, as well as analyzing behavioral data, and disseminating findings through publications.

I developed privacy-preserving methods for accurate sensing of physical behavior in domestic environments. This involved the use of RGB-D imaging, non-parametric background modeling, body motion and non-motion estimation with human pose and optical flow, and object detection. This deals with challenges such as low lighting, moving pets, and reliably detecting critical events such as prolonged inactivity (e.g., loss of consciousness) and prolonged room occupancy (e.g., fall in the bathroom).

My research then progressed toward long-term behavior monitoring for in-home healthcare, targeting the inference of physical weakness using Bayesian Networks (BN) with environmental context. I also evaluated behavior changes associated with fasting and with beneficial daily interventions. These works included the analysis of long-term motion and posture patterns, activity recognition using Convolutional Neural Networks (CNNs), Long Short-Term Memory (LSTM), Variational Autoencoder (VAE), statistical testing, temporal modeling with Gaussian Processes (GP), and change point detection (CPD).

Side projects included 2D/3D surgical tool pose estimation, multi-sensor physiological and behavioral data fusion, and human activity-level estimation.

2015–2020, Human–machine operation analysis in egocentric vision

As a PhD student at Kyoto University, I investigated human–machine operational behaviors in egocentric vision, focusing on computer vision-based touch sensing, including egocentric RGB-D, palm-oriented touch detection, hotspots detection, temporal clustering.

I then applied temporal modeling of operational actions using Hidden Markov Models (HMMs), and developed methods to address the degree of freedom of tasks, such as repetition and changes in order, using HMM with optimal structure, dynamic alignment, customized Viterbi, and graph model. I also worked on task skill assessment, comparing novices with experts through gaze tracking and operational actions, focusing on prototype selection, and interpretability, to enable automatic task guidance.

Additionally, I pursued side projects that included developing an omnidirectional video-messaging platform with face detection, and hand gesture classification. During my visiting in Bristol University, I am working on gaze estimation with Google Glass.

Pre 2015

My master's coursework focused on computer-vision-based video denoising, including the use of compressed sensing and low-rank methods. My undergraduate project involved developing a paper keyboard using a camera and a single-chip microcomputer (SCM).

Teaching and Administration

- Co-supervised MSc students (with Prof. Bob Fisher) on topics including old adult activity recognition and activity-level estimation, School of Informatics, University of Edinburgh. Delivered two academy lectures for PhD students. Proposed the summer course for PhD students at ACRC.
- Organized the Firbush retreat for PDRA staff in Informatics. Participated in PDRA meetings and academic development courses.
- Teaching Assistant, *Spatio-temporal Data Analysis for Multimedia*, Kyoto University

Conferences, Presentations, and Seminars

- Best Paper Candidate, International Conference on AI in Healthcare, Cambridge, 8–10 September 2025.
- Best Presentation Award, AI and Dementia International Workshop, Toronto, Canada, 5–6 May 2025.
- Presentation, 12th International Workshop on Assistive Computer Vision and Robotics. Topic: *OPPH: A Vision-Based Operator for Measuring Person Body Movements in Healthcare*.
- Presentation, Research Day, AI in Healthcare Workshop. Topic: *Monitoring Inactivity and Weakness in Older Adults Living Alone at Home Using a Camera*.
- Presentations, AIAI Seminar Series and IPAB Seminars, School of Informatics, University of Edinburgh.
- Attended Wired Health 2023 and 2024, Digital Health and Care Scotland 2024, Scotland's Health Research and Innovation Conference 2023, BMVC 2021, and the Scottish AI Summit.
- Presentation, 14th ICT Innovation Conference, Kyoto University. Topic: *User Behavior Analysis and Modeling for Machine Operation Tasks in Egocentric Vision*.
- Presentation, IEICE, September 2018. Topic: *Integration of Expert and Beginner Experiences of Machine Operations Captured Through Egocentric Vision*.
- Presentation, IEICE, January 2017. Topic: *Detection of Hotspots for Machine Operations from First-Person Vision Records*.
- Summer Seminar Series, Kyoto University, Japan: *Deep Learning Fundamentals* (2015), *Human Tracking and Identification* (2016), *Webcam on Raspberry Pi for Face/Scene/Color Recognition* (2017), *CNN-Based Indoor Scene Recognition* (2018), *Multi-Label Classification for Outdoor Scenes* (2019), and *GoProMax Data Collection in the Forest* (2020).