HAO WANG

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Division of Production Systems, Department of Industrial and Materials Science

Chalmers University of Technology

EDUCATION

Chalmers University of Technology　　　　　　　　　　　　　　　　　　**2021 - Present**
Ph.D. student in Product and Production Development　　　　　　　　　　　*Gothenburg, Sweden*

The University of Edinburgh　　　　　　　　　　　　　　　　　　　　　**2018 - 2019**
MSc with Distinction in Informatics　　　　　　　　　　　　　　　　　　*Edinburgh, UK*

University of Skövde　　　　　　　　　　　　　　　　　　　　**Sept. 2016 - Jan. 2017**
Exchange Student in Informatics　　　　　　　　　　　　　　　　　　　　*Skövde, Sweden*

Beijing University of Posts and Telecommunications　　　　　　　　　　　**2014 - 2018**
B.Eng. in Telecommunication Engineering　　　　　　　　　　　　　　　　*Beijing, China*

PUBLICATION

— Journal —

2. Wang, H., Salunkhe, O., Quadrini, W., Lämkull, D., Ore, F., Despeisse, M., Fumagalli, L., Stahre, J., & Johansson, B. (2024). A systematic literature review of computer vision applications in robotized wire harness assembly. *Advanced Engineering Informatics*, *62*, 102596. doi:10.1016/j.aei.2024.102596

1. Zhu, X., Yu, C., Huang, D., Lei, Z., Wang, H., & Li, S. Z. (2023). Beyond 3dmm: Learning to capture high-fidelity 3d face shape. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *45*(2), 1442-1457. doi:10.1109/TPAMI.2022.3164131

— Conference —

6. Wang, H., Salunkhe, O., Quadrini, W., Lämkull, D., Ore, F., Johansson, B., & Stahre, J. (2023). Overview of computer vision techniques in robotized wire harness assembly: Current state and future opportunities. *Procedia CIRP*, *120*, 1071-1076. doi:10.1016/j.procir.2023.09.127

5. Salunkhe, O., Quadrini, W., Wang, H., Stahre, J., Romero, D., Fumagalli, L., & Lämkull, D. (2023). Review of current status and future directions for collaborative and semi-automated automotive wire harnesses assembly. *Procedia CIRP*, *120*, 696-701. doi:10.1016/j.procir.2023.09.061

4. Wang, H., & Johansson, B. (2023). Deep learning-based connector detection for robotized assembly of automotive wire harnesses. *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)*, 1-8. doi:10.1109/CASE56687.2023.10260619

3. Despeisse, M., Johansson, B., Bokrantz, J., Braun, G., Chari, A., Chen, X., Fang, Q., González Chávez, C. A., Skoogh, A., Stahre, J., Theradapuzha Mathew, N., Turanoglu Bekar, E., Wang, H., & Örtengren, R. (2023). Battery production systems: State of the art and future developments. *Advances in Production Management Systems. Production Management Systems for Responsible Manufacturing, Service, and Logistics Futures*, 521-535. doi:10.1007/978-3-031-43688-8_36

2. Zhu, X., Wang, H., Fei, H., Lei, Z., & Li, S. Z. (2021). Face forgery detection by 3d decomposition. *2021 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2928-2938. doi:10.1109/CVPR46437.2021.00295

1. Zhu, X., Yang, F., Huang, D., Yu, C., Wang, H., Guo, J., Lei, Z., & Li, S. Z. (2020). Beyond 3dmm space: Towards fine-grained 3d face reconstruction. *Computer Vision - ECCV 2020*, 343-358. doi:10.1007/978-3-030-58598-3_21

— Report —

1. 2023 World Manufacturing Report: New Business Models for the Manufacturing of the Future

— Thesis —

1. Wang, H. (2024). *Toward enabling robotic visual perception for assembly tasks* [Licentiate thesis]

RESEARCH PROJECTS

Empowering Human Workers for Assembly of Wire Harnesses (EWASS)   2022-2025
SIP Produktion2030, VINNOVA

- To assist the industry in ensuring a sustainable work-life by empowering human workers during assembly of wire harnesses
- To improve productivity, quality, and ergonomics of assembly installation of wire harnesses and high voltage cables using collaborative robots, thereby boosting the manufacturing of electrified vehicles

PLENary multi-User developMent arena for future industrial workspaces (PLENUM)   2022-2025
VINNOVA

- To provide industry with methods and design tools to create sustainable factories/workplaces/manual operations in a multi-user development environment
- To develop and demonstrate an easy-to-use (low threshold) cost-effective interactive multi-user 3D environment for development, workplace design, upskilling and ergonomic analysis that includes thousands of users and reduces environmental impact

Boosting the Exploitation of Standardisation Inputs from European Projects (STAND4EU)   2022-2024
EU

- To strengthen the links between research, innovation and standardisations ensuring that standardisation is an integral part of the European research and innovation landscape

DIGITAL work InStructions for cognitive work (DIGITALIS)   2022-2024
SIP Produktion2030, VINNOVA

- To demonstrate how systematic development of cognitive support and information design can increase quality and flexibility in future production

A Pan-European Network of Robotics DIHs for Agile Production (DIH[2])   2019-2023
EU

- To spark incremental and disruptive innovations in over 300,000 Manufacturing SMEs and Mid-Caps
- Project webpage

OTHER PROJECTS

Gender Identification from 3D Facial Surface Model   Feb. 2019 - Aug. 2019
Dissertation for Master's degree

- Proposed a novel method on 3D facial gender identification with machine learning & conformal mapping
- Evaluated the proposed method and obtained competitive performance (accuracy over 88%)

Action Recognition Model with First-Person Videos   Jan. 2019 - Mar. 2019

- Evaluated third-person action recognition methods with first-person datasets
- Compared the differences between the third and first-person methods
- Proposed and studied a new model combining MobileNet and Two-stream Pyramid

Image Super-Resolution with Convolutional Neural Network   Dec. 2017 - June 2018
Dissertation for Bachelor's degree

- Realized the subpixel-based image super-resolution method with pixel shuffle
- Tested the model on both image and video datasets

RESEARCH EXPERIENCE

National Laboratory of Pattern Recognition, CASIA   Oct. 2019 - June 2021
Research Intern   *Beijing, China*

- Projects: Fine-grained 3D face reconstruction; Face forgery detection; Face anti-spoofing

Next Generation Internet Research Center, BUPT   May 2017 - Oct. 2017
Undergraduate Research Assistant   *Beijing, China*

· **Projects: Optimization on DASH-based video service in high-speed railway networks with stochastic methods; Network flow variation detection with mobile crowd sensing**

TEACHING EXPERIENCE

MPR213 Robotics and Manufacturing Automation
Chalmers
· **Apr.‑May 2024: Lecturer (Robotics, AI, and computer vision)**

LMT108 Automation Technique
Chalmers
· **Jan.‑Mar. 2024: Lecturer (Robotics, AI, and computer vision)**

IMS020 Simulation and Visualisation of Production Systems
Chalmers
· **Sept.‑Oct. 2021: Lab assistant**
· **Sept.‑Oct. 2022: Course coordinator, lecturer, and lab assistant; Course evaluation: 4.2/5.0**
· **Sept.‑Oct. 2023: Course coordinator, lecturer, and lab assistant; Course evaluation: 3.75/5.0**

PPU055 Virtual production
Chalmers
· **Oct.‑Dec. 2021: Lecturer and lab assistant**
· **Oct.‑Dec. 2022: Lecturer and lab assistant**

IMS085 Simulation and optimization of sustainable production systems
Chalmers
· **Jan.‑May 2022: Lab assistant**
· **Jan.‑May 2023: Lab assistant**
· **Jan.‑May 2024: Lab assistant**

PPU161 Production systems
Chalmers
· **Oct.‑Dec. 2022: Project tutor**

PPU215 Research methodology in production projects
Chalmers
· **Jan.‑Mar. 2022: Project tutor**

PPU156 Computer Aided Design (CAD)
Chalmers
· **Oct.‑Dec. 2021: Lecturer (3D scanning)**

ACADEMIC SERVICE

Reviewer: IEEE International Conference on Multimedia and Expo

SKILLS

Programming Languages: Python, MATLAB, C, C++, Java, Go, VHDL, Verilog, Assembly Language

Tools: PyTorch, Tensorflow, OpenCV, Dlib, Plant Simulation, Visual Components, RobotStudio

Others: Linux, Git, SQL, LaTeX, FPGA, Arduino, Raspberry Pi, NVIDIA Jetson Nano, PolyScope