



Yegang Du

CONTACT INFORMATION

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EDUCATION

2015.10 - **Ph.D.**, *Information Science*, School of Information Science.

- 2020.03 Japan Advanced Institute of Science and Technology (JAIST), Japan

Advisor - Prof. Yasuo Tan

Research Area – *IoT and Smart Home*

2017.03- **Internship**, *School of Computer Science and Technology*.

-2017.08 Tianjin University, China

Advisor – Prof. Keqiu Li

Research Area – *Smart Library System*

2012.09- **M.S.**, *Computer Science*, Information Science and Technology College.

-2015.01 Dalian Maritime University, China

GPA – 3.49/4 (Top 3%)

Advisor – Prof. Wenyu Qu

Research Area – *Image Retrieval*

2008.09- **B.Eng.**, *Network Engineering*, Information Science and Technology College.

-2012.07 Dalian Maritime University, China

GPA – 3.46/4 (Top 10%)

Main Courses – *Data Structure, Communication Network, Computer Network, The Principle of TCP/IP Protocols, etc*

Ph.D. THESIS

Title *Human Body EMI-based Activity Recognition and Prediction for Smart Environments*

Description This thesis divides human activities in smart home into two levels. Passive RFID tags are used to recognize the low level activities, and to further infer the high level activities. Besides, this thesis predicts the next possible activity utilizing deep learning model based on the log of recognized activities. This thesis also carries out the model in smart library. Recognizing the off-line reading activity can better uncover the reader's habit and promote book management. By collecting and analyzing RFID signal feature, the model can trace the reader's trajectory, and recognize which book is picked up.

WORK EXPERIENCE

- 2024.05- **Assistant Professor**, *Smart Ageing International Research Center*.
-Now Tohoku University, Japan
Research - Making use of Generative AI in social data distribution; Using AI to analyze human bio-indicators; Responsible for international cooperation and joint projects.
- 2022.05- **Junior Researcher**, *Future Robotics Organization*.
-2024.03 Waseda University, Japan
Research - Social Robot for Elderly.
- 2021.05- **Lecturer**, *Navigation College*.
-2022.04 Dalian Maritime University, China
Research - Environmental Information Processing.
- Visiting Researcher**, *Big Data Integration Research Center*.
National Institute of Information and Communications Technology (NICT), Japan
- 2020.04- **Fixed Term Researcher**, *Big Data Integration Research Center*.
-2021.03 National Institute of Information and Communications Technology (NICT), Japan
Advisor - Dr. Koji Zettsu
Research - Air Quality Index(AQI) Prediction with Federated Learning
- 2019.10- **Research Fellow**, *Center for Trustworthy IoT Infrastructure*.
-2020.03 Japan Advanced Institute of Science and Technology (JAIST), Japan
Advisor - Prof. Yasuo Tan
Research - Implementation of Smart Home Framework based on ECHONET

RESEARCH PROJECTS

Waseda University

2022–Now **DATA SENDAI Frontline**.

Supported by Sendai Government

Improvement of social participation function by utilizing AI and data collaboration infrastructure to support the future society of Sendai City with fewer children, older adults, and co-workers. Construction of an Advanced Coaching Infrastructure to Enrich the Lives of Individual Residents.

Waseda University

2022–Now **EU-Japan Virtual Coach for Smart Aging**.

Supported by MIC JPJ000595

The overall objective of e-ViT is to improve well-being in older adults in Europe and Japan, and thereby promote active and healthy ageing, contribute to independent living, and reduce risks of social exclusion of older adults.

National Institute of Information and Communications Technology

2020–2021 **Air Quality Index (AQI) prediction with Federated Learning**.

Build general federated learning framework to predict the AQI with monitor station data in Japan. The CRNN model is utilized to excavate the temporal and spatial variation of the AQI in different areas. Through federated learning framework, global CRNN model can be trained on the premise of protecting data privacy.

Japan Advanced Institute of Science and Technology

2018–2020 **Autonomous Operation Networks of IoT Area**.

Supported by CAO PRISM (JPY: 119M)

Survey of machine learning and deep learning algorithms for large scale sensing data. Prepare the hardware and software platform for testbed of smart IoT in agriculture. Propose practical approach to promote agriculture management using various sensors.

2015–2017 **Joint Research with Honda R&D Co., Ltd..**

Supported by Honda R&D Co., Ltd.

Analyse home activity of inhabitant with wireless sensing technology. Recognize human activity and provide specific service in real time. Make simulation on activities of daily living to predict future activity of inhabitant.

Tianjin University

2017 **The Basic theory and Key Technology of Software-defined Networks.**

Supported by NSFC 61432002 (CNY: 3.5M)

Propose a device-free method to record reader's activity in the library. The method utilizes RFID tags attached on each books in the bookshelf and the interaction between reader and books to real time monitor reader's activity.

Dalian Maritime University

2015–2016 **The Key Technology Research of Mobile Visual Retrieval.**

Supported by NSFC 61370199 (CNY: 760K)

Given a query image taken by mobile devices, MVS system extracts its visual descriptors firstly. Then, the descriptors are transmitted to the server after being compressed based on salience. Finally, the server gives the feedback of images similar with the query image.

PUBLICATIONS

International Journals (12 in total)

Yuan Yuan, **Yegang Du**, Jun Pan. "An Intelligent Web Service Discovery Framework based on Improved Biterm Topic Model", in IEEE Access, 2024

Zhichen Liu, Ying Li, Zhaoyi Zhang, Jiyong Wang, **Yegang Du**. "A dynamic topology analysis method for multi-ship encounters based on multi time-space network trees", in Ocean Engineering, 2024

Zhichao Peng, Hua Zeng, Yongwei Li, **Yegang Du**, Jianwu Dang. "Enhancing Dimensional Emotion Recognition from Speech through Modulation-Filtered Cochleagram and Parallel Attention Recurrent Network", in Electronics, 2023

Zhichen Liu, Ying Li, Zhaoyi Zhang, Wenbo Yu, **Yegang Du**. "Spatial modeling and analysis based on spatial information of the ship encounters for intelligent navigation safety", in Reliability Engineering & System Safety, 2023

Ken Sinkou Qin, **Yegang Du**. "Simultaneous fault detection and isolation based on multi-task long short-term memory neural networks", in Chemometrics and Intelligent Laboratory Systems, 2023

Zhichen Liu, Ying Li, Zhaoyi Zhang, Wenbo Yu, Bing Han, **Yegang Du**. "Spatial modeling and analysis approach for ship-encounters dynamic spatialtemporal domain", in Ocean Engineering, 2023

Zhichao Peng, Wenhua He, Yongwei Li, **Yegang Du**, Jianwu Dang. "Multi-Level Attention-Based Categorical Emotion Recognition Using Modulation-Filtered Cochleagram", in Applied Sciences, 2023

Yegang Du, Yuto Lim, Yasuo Tan. "A Novel Human Activity Recognition and Prediction in Smart Home Based on Interaction", in Sensors, 2019

Yegang Du, Yuto Lim, Yasuo Tan. "Activity Recognition Using RFID Phase Profiling in Smart Library", in IEICE Transaction on Information and Systems, 2019

Lin Han, Weijiang Liu, Zhiyang Li, Wenyu Qu, Mingqian Bai, **Yegang Du**. "A Novel Detector for Persistent Spreads over Data Center Based on Bloom Filter", in ICIC Express Letters, 2017

Yegang Du, Zhiyang Li, Milos Stojmenovic, Wenyu Qu, Heng Qi. "A Low Overhead Progressive Transmission for Visual Descriptor Based on Image Saliency", in Journal of Multiple-Valued Logic and Soft Computing, 2015

Siyang Miao, Zhiyang Li, Wenyu Qu, **Yegang Du**, Songhe Wang, Heng Qi. "Progressive Transmission Based on Wavelet Used in Mobile Visual Search", in Journal of Embedded Systems, 2014

International Conferences (15 in total)

Yegang Du, Toshimi Ogawa, Rainer Wieching, Yasuyuki Taki. "Personalized Social Event Recommendation System for Older Adults Using LLM-based AI Agents: Prototype Development", in proceedings of ACM CHI, 2025(submitted)

Riya Mahajan, **Yegang Du**, Alexander Schmitz, Gabriele Trovato, Yasuyuki Taki, Shigeki Sugano. "uSkin Pillow: Tactile-Sensor-Based Non-Invasive Approach to Sleep Analysis", in proceedings of IEEE CyberSciTech, 2024

Gabriele Trovato, **Yegang Du**, Scean Mitchell, Franco Pariasca Trevejo, Rodrigo Lopez Condori, Masao Katagiri, Rio Obe, Manishk Gawande, Sarah Cosentino, Mehrbod Manavi, Felix Carros, Rainer Wieching. "CelesTE, theomorphic device for cognitive support of older adults", in proceedings of IEEE ARSO, 2024

Gabriele Trovato, Yueh-Hsuan Weng, **Yegang Du**. "'Never complain, never explain': why robots may not have to be explicable after all", in proceedings of IEEE ICRA Workshop, 2023

Yegang Du, Kaiyuan Zhang, Gabriele Trovato. "Composite Emotion Recognition and Feedback of Social Assistive Robot for Elderly People", in proceedings of HCII, 2023

Zhihao Shen, Nanaka Urano, Chih-Pu Chen, Shi Feng, Scean Mitchell, Masao Katagiri, **Yegang Du**, Franco Pariasca Trevejo, Tito P. Tomo, Alexander Schmitz, Ryan Browne, Toshimi Ogawa, Yasuyuki Taki, Gabriele Trovato. "Participatory Design and Early Deployment of DarumaTO-3 Social Robot", in proceedings of ICSR, 2022

Yegang Du. "A Scheme for Sensor Data Reconstruction in Smart Home", in proceedings of NSS, 2021

Yegang Du, Yuto Lim, Yasuo Tan. "RF-ARP: RFID-based Activity Recognition and Prediction in Smart Home", in proceedings of IEEE ICPADS, 2019

Yegang Du, Yuto Lim, Yasuo Tan. "Activity Prediction Using LSTM in Smart Home", in proceedings of IEEE GCCE, 2019

Yegang Du, Yuto Lim, Yasuo Tan. "Reading Activity Recognition in Smart RF-Library", in proceedings of IEEE GCCE, 2018

Yegang Du, Yasuo Tan, Yuto Lim. "RF-Switch: A Novel Wireless Controller in Smart Home", in proceedings of IEEE ICCE-TW, 2018

Yegang Du, Zhiyang Li, Wenyu Qu, Siyang Miao, Songhe Wang, Heng Qi. "MVSS: Mobile Visual Search Based on Saliency", in proceedings of IEEE HPCC, 2013

Jun Wang, Zhiyang Li, **Yegang Du**, Wenyu Qu. "Stacked Product Quantization for Nearest Neighbor Search on Large Datasets", in proceedings of IEEE Trustcom/BigDataSE/ISPA, 2016

Qi Zhang, Zhiyang Li, **Yegang Du**, Wenyu Qu. "A Novel Multi-table Indexing in Mobile Visual Search", in proceedings of IEEE DASC, 2014

Songhe Wang, Zhiyang Li, Siyang Miao, **Yegang Du**, Wenyu Qu, Junjie Cao. "Strand Structures Detection for 2D Shapes Based on Visibility", in proceedings of ICGIP, 2013

Domestic Conferences

Yegang Du, Yuto Lim, Yasuo Tan. "Activity Prediction Using LSTM in Smart Home", in proceedings of IEICE General Conference, 2019

Yegang Du, Pham Van Cu, Yasuo Tan, Yuto Lim. "A Solution of Activity Recognition in Smart Home Using Passive RFID Tags", in proceedings of IEICE General Conference, 2018

TEACHING EXPERIENCE

- 2022-2023 Guest Lecture – *Introduction to Internet of Things*
- 2021-2022 Lecturer – *Wireless Sensor Networks; Specialized English for GIS*
- 2012-2014 Teaching Assistant – *Network and High Performance Computing*
- 2008-2012 Teaching Assistant – *Computer Science*

EXTRACURRICULAR SERVICE

Session Chair of Conferences – *CyberSciTech 2024; ICPADS 2019*

Reviewer of Conferences – *SmartIoT 2020; ICPADS 2019*

Reviewer of Journals – *IEEE Network; IEEE Transactions on Mobile Computing; IEEE Transactions on Computers; IEEE Journal on Selected Areas in Communications; IEEE Robotics and Automation Letters; Sensors; Electronics; Applied Sciences*

LANGUAGES

English – TOEIC-775, CET-6

Japanese – JLPT-N2

Chinese – Mother Tongue

CERTIFICATION AND LICENSE

Certification – Cisco Certified Network Associate(CCNA)

License – Chinese/Japanese Driver License

AWARDS

- 2021 Overseas High-Level Talents of Chinese Nationality
- 2016 China Scholarship Council(CSC) and JAIST Joint Scholarship
- 2015 Japan Monbukagakusho Honors Scholarship for Privately-Financed International Students
- 2015 JAIST Doctoral Research Fellow