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Official Website: <https://www.eng.ed.ac.uk/about/people/dr-yunjie-yang>DDI Programme Website: <https://ddi.ac.uk/chancellors/yunjie-yang/>Research Group Website: <https://www.yangresearchgroup.com/>**QUALIFICATIONS**

- **The University of Edinburgh** Edinburgh, UK
Ph.D. in Engineering and Electronics 04/2014 – 01/2018
 Thesis: Advanced digital electrical impedance tomography system for biomedical imaging
 Supervisors: Dr. Jiabin Jia (principal), Dr. Nicolas Polydorides (second)
- **Tsinghua University** Beijing, China
M.Sc. in Control Science & Engineering 08/2010 – 07/2013
 Thesis: Sensing strategy and image reconstruction for electrical capacitance tomography
 Supervisor: Prof. Lihui Peng
- **Anhui University** Anhui, China
B.Eng. in Measurement & Control Engineering 09/2006 – 07/2010
 Thesis: Preliminary study of femtosecond laser parallel micro-nano fabrication

EMPLOYMENT

- **The University of Edinburgh** Edinburgh, UK
Chancellor's Fellow/Lecturer in Data Driven Innovation, School of Engineering 09/2018 – Present
 Research Areas:
 Process tomography, Biomedical imaging, Machine learning, Sensor and systems
Post-doctoral Research Associate, School of Engineering 01/2018 – 09/2018
 Research Project: Chemical Species Tomography
 Line manager: Prof. Hugh McCann, FEng, FRSE
- **University of Connecticut** Connecticut, USA
Research Assistant, Department of Mechanical Engineering 08/2013 – 02/2014
 Research Project: Cyber-physical Infrastructure for Smart City
 Supervisor: Prof. Robert X. Gao, FIEEE, FASME

RECOGNITIONS

- Best Poster Award of 4th Conference on Impedance-Based Cellular Assays 2018

- Best Student Paper Award of IEEE International Conference on Imaging Systems and Techniques 2017
- IEEE I&M Society Graduate Fellowship Award (\$15k, one of five recipients selected globally) 2015
- Outstanding Entrepreneurial Project of OTEC Startup Competition Global Finals (\$15k) 2015
- Champion of OTEC Startup Competition UK Finals 2015
- Outstanding (top 3%) Master's Graduate of Tsinghua University 2013
- Outstanding (top 3%) Master's Thesis of Tsinghua University 2013
- ZHEFU TAO Scholarship of Tsinghua University 2012
- Outstanding (top 3%) College Graduate of Anhui Province, China 2010
- Outstanding (top 3%) Innovation Project of Anhui University 2009
- Outstanding (top 3%) Undergraduate of Anhui Province, China 2008
- National Scholarship of China (top 1%) 2008
- Outstanding Winner in the 2nd Robotics Competition of Anhui University 2007
- Scholarship for Outstanding College Student in Anhui University 2007

PROFESSIONAL ACTIVITIES

- **Associate Editor**
IEEE Access (IF 4.098, JCR Q1)
- **Equality Impact Champion**
School of Engineering, University of Edinburgh
- **Membership**
Member, IEEE, IEEE Instrumentation & Measurement Society
Member, IET
Member, International Society for Industrial Process Tomography (ISIPT)
- **Conference Steering Committee**
2017 IEEE International Conference on Imaging Systems and Techniques (IST)
- **Technical Program Committee Member**
2015—2019 IEEE IST
- **Session Chair**
Session: Advances in Imaging Technology, 2019 IEEE IST
Session: Tomographic Devices: Clinical and Industrial Applications I, 2017 IEEE IST
- **Reviewer for Journal and Conference**
IEEE Transactions on Instrumentation and Measurement
Transactions of the Institute of Measurement and Control
IEEE Transactions on Applied Superconductivity
Asia-Pacific Journal of Chemical Engineering
Measurement Science and Technology
Multimedia Tools and Applications
Annals of Biomedical Engineering
Review of Scientific Instruments
Journal of Neural Engineering

Journal of Clinical Medicine
 Journal of Applied Physics
 Chinese Optics Letters
 IEEE Sensors Journal
 Materials and Design
 Measurement
 IEEE Access
 Processes
 Energies
 Sensors

IEEE International Conference on Imaging Systems and Techniques
 International Conference on Biomedical Applications of Electrical Impedance Tomography

RESEARCH >> PROJECTS

- **Intelligent multiphase flow sensing and big data analysis**
 (H2020, DDI and Industry Co-Fund Project, £202k, Principal Investigator) 01/2020 – 12/2023

 - Investigate multi-modal tomography system for multiphase flow sensing.
 - Develop machine learning algorithms for flow visualisation and characterisation.
- **Machine learning for multiphase flow measurement based on massive sensing data**
 (Industry Project, £35k, Principal Investigator) 09/2019 – 08/2021

 - Investigate machine learning methods for multi-modal sensor data analysis.
 - Facilitate technology transfer of AI based multiphase flow metering.
- **Cost-efficient point-of-care technique for cancer care**
 (LMIC Travel & Partnership Fund, £3k, Principal Investigator) 05/2019 – 06/2019

 - Investigate cost-efficient point-of-care cancer care technique.
 - Foster interdisciplinary and international collaboration to tackle global challenges.
- **Machine Learning Aided Agile Tomography for Process Analysis**
 (UoE New Staff Start-up Grant, £60k, Principal Investigator) 09/2018 – 08/2020

 - Develop multi-modality tomographic imaging platform for industrial and biomedical applications.
 - Investigate efficient data analysis methods of agile tomography (electrical and optical process tomography) for biomedical imaging and industrial process analysis.
 - Project planning, finances management, budgeting for outsourcing and purchasing.
- **In-situ Chemical Measurement and Imaging Diagnostics for Energy Process Engineering (CIDER)**
 (EPSRC Platform Grant (EP/P001661/1), £1,834k, Postdoc) 10/2017 – 07/2018

 - Collaborative research on high-speed, distributed embedded sensing system for in-situ tomographic imaging of aero-engine exhaust plume pollutant gases.
 - Independent research on efficient, high-resolution image reconstruction algorithms for Chemical Species Tomography (CST).
- **An Advanced Digital EIT System for Biomedical Imaging**
 (IEEE Funded Project, \$15k, Principal Investigator) 04/2015 – 04/2017

- Independent research on bioimpedance tomography, including advanced sensing systems, miniature bio-sensors and inverse problems.
- Built and demonstrated a novel multi-frequency EIT system.
- Project planning, finances management, budgeting for outsourcing and purchasing.
- **A Unified Platform for Multi-phase Flow Measurement**
(UoE Development Trust Funded IIG Project, £4.8k, Principal Investigator) 03/2016 – 03/2017
 - Independent research on a unified, modular sensing platform for multi-modality tomographic imaging.
 - Project planning, finances management, budgeting for outsourcing and purchasing.
 - Close collaboration with researchers from Tianjin University, China on this research topic.

RESEARCH >> INDUSTRIAL ENGAGEMENT

- **Consultancy**, Distilled Solutions, Edinburgh, UK 08/2018
 - Consultancy on developing gas/liquid flow visualisation technique for whisky production.
 - Held regular technical meetings with the research team from Distilled Solutions.
- **Invited Short-term Visiting**, Leengstar Technology Co. Ltd, Shenzhen, China 09/2017
 - Consultancy on finalization of product design and plan for online multiphase flow meter.
 - Led the technical meetings with China National Petroleum Corporation.
- **Invited Short-term Visiting**, Leengstar Technology Co. Ltd, Shenzhen, China 03/2017 – 04/2017
 - Led the development of a key algorithm for multiphase flow meter to calculate water in liquid ratio and gas volume fraction based on electrical tomography.
 - Led the implementation of lab-scale and field tests of the algorithm.

RESEARCH >> TECHNOLOGY TRANSFER AND IMPACT

- **High-speed ECT system for industrial imaging**
 - A system was purchased by AIE Ltd in UK for industrial applications. A 3-D real-time tomographic imaging software was licensed to them for one year.
- **Multi-frequency EIT System for biomedical Imaging** (one of my PhD research outcomes)
 - A system was purchased by Pennsylvania State University in US, to carry out research on advanced materials and sensors. A 3-D real-time tomographic imaging software was licensed to PSU as well.

RESEARCH >> PUBLICATIONS

THESIS

- [1] **Yang, Y.**, (2018). Advanced digital electrical impedance tomography system for biomedical imaging. PhD thesis, School of Engineering, University of Edinburgh.

REFEREED JOURNALS

- [1] Li, N., Cao, M., Xiao, J., Jia, J., **Yang, Y.** (2019). High Sensitive Capacitive Sensing Method for Thickness Detection of the Water Film on an Insulation Surface. *IEEE Access*. (accepted)
- [2] **Yang, Y.**, Wu, H., Bagnaninchi, P., Jia, J. (2019). Scaffold-based 3-D cell culture imaging using a miniature EIT sensor. *IEEE Sens. J.* DOI: [10.1109/JSEN.2019.2924154](https://doi.org/10.1109/JSEN.2019.2924154).

- [3] Wu, H., **Yang, Y.**, Bagnaninchi, P., Jia, J. (2019). Calibrated frequency-difference electrical impedance tomography for 3D tissue culture monitoring. *IEEE Sens. J.* DOI: [10.1109/JSEN.2019.2919182](https://doi.org/10.1109/JSEN.2019.2919182).
- [4] Fisher, E., Stylianou, T., **Yang, Y.**, Chighine A., Liu, C., Polydorides, N., Wright, P., Johnstone, W. McCann, H. (2019). A Custom, High-Channel-Count Data Acquisition System for Chemical Species Tomography of Aero-Jet Engine Exhaust Plumes. *IEEE Trans. Instrum. Meas.* DOI: [10.1109/TIM.2019.2895932](https://doi.org/10.1109/TIM.2019.2895932).
- [5] Liu, S., Wu, H., Huang, Y., **Yang, Y.**, Jia, J. (2019). Accelerated Structure-Aware Sparse Bayesian Learning for 3D Electrical Impedance Tomography. *IEEE Trans. Ind. Inform.* DOI: [10.1109/TII.2019.2895469](https://doi.org/10.1109/TII.2019.2895469).
- [6] Wang, H., Jia, J., **Yang, Y.**, Buschle, B., Lucquiaud, M. (2018). Quantification of Gas Distribution and Void Fraction in Packed Bubble Column Using Electrical Resistance Tomography. *IEEE Sens. J.*, 18(21), 8963-8970.
- [7] Wu, H., **Yang, Y.**, Bagnaninchi, P., Jia, J. (2018). Electrical Impedance Tomography for real-time and label free cellular viability assays of 3D tumour spheroids. *Analyst*, 143(17), 4189-4198.
- [8] Wu, H., Buschle, B., **Yang, Y.**, Tan, C., Dong, F., Jia, J., Lucquiaud, M. (2018). Liquid distribution and hold-up measurement in counter current flow packed column by electrical capacitance tomography. *Chem. Eng. J.*, 353, 519-532.
- [9] Wu, H., Zhou, W., **Yang, Y.**, Jia, J., Bagnaninchi, P. (2018). Exploring the Potential of Electrical Impedance Tomography for Tissue Engineering Applications. *Materials (Basel, Switzerland)*, 11(6).
- [10] Liu, S., Jia, J., Zhang, Y. D., **Yang, Y.** (2018). Image Reconstruction in Electrical Impedance Tomography Based on Structure-Aware Sparse Bayesian Learning. *IEEE Trans. Med. Imag.*, 37(9), 2090-2102.
- [11] Yin, X., Wu, H., Jia, J., **Yang, Y.** (2018). A Micro EIT Sensor for Real-time and Non-destructive 3-D Cultivated Cell Imaging. *IEEE Sens. J.*, 18(13), 5402-5412.
- [12] **Yang, Y.**, Jia, J. (2017). An Image Reconstruction Algorithm for Electrical Impedance Tomography Using Adaptive Group Sparsity Constraint. *IEEE Trans. Instrum. Meas.*, 66(9), pp. 2295-2305.
- [13] **Yang, Y.**, Jia, J., Smith, S., Jamil, N., Gamal, W., Bagnaninchi, P. O. (2017). A Miniature Electrical Impedance Tomography Sensor and 3-D Image Reconstruction for Cell Imaging. *IEEE Sens. J.*, 17(2), 514-523.
- [14] **Yang, Y.**, Wu, H., Jia, J. (2017). Image Reconstruction for Electrical Impedance Tomography Using Enhanced Adaptive Group Sparsity with Total Variation. *IEEE Sens. J.*, 17(17), pp. 5589-5598.
- [15] **Yang, Y.**, Jia, J., (2017). A Multi-frequency Electrical Impedance Tomography System for Real-time 2D and 3D Imaging. *Review of Scientific Instruments*, 88, 085110.
- [16] **Yang, Y.**, Peng, L., Jia, J. (2017). A novel multi-electrode sensing strategy for electrical capacitance tomography with ultra-low dynamic range. *Flow Meas. Instrum.*, 53, 67-79.
- [17] Wang, H., **Yang, Y.**, Jia, J., Jin, O. (2017). Solid Particles' Composition Using Electrical Capacitance Tomography. *IEEE Access*, 5, pp. 15875-15882.
- [18] **Yang, Y.**, Peng, L. (2013). Data pattern with ECT sensor and its impact on image reconstruction. *IEEE Sens. J.*, 13(5), 1582-1593. (**Cover Story**)
- [19] **Yang, Y.**, Peng, L. (2013). A configurable electrical capacitance tomography system using a combining electrode strategy. *Meas. Sci. Technol.*, 24(7), 074005.

REFEREED CONFERENCES

- [1] Sun, Z., Wang, H., Zhang, M., **Yang, Y.**, 2019, July. Multiple measurement vector based image reconstruction for multifrequency impedance imaging using capacitive sensor. *20th International Conference on Biomedical Applications of Electrical Impedance Tomography*, London, UK.
- [2] **Yang, Y.**, Jia, J., 2018, September. Fast 3-D Electrical Impedance Spectroscopic Imaging Using Extended Joint Sparsity. *9th World Congress on Process Tomography*, Bath, UK.
- [3] Fisher, E., **Yang, Y.**, Tsekenis, S-A., etc., 2018, September. Analog-Signal Quality Characterization of the FLITES Distributed 192-Channel Data Acquisition System. *9th World Congress on Process Tomography*, Bath, UK.
- [4] Wu, H., Buschle, B., **Yang, Y.**, Tan, C., Dong, F., Jia, J., Lucquiaud, M., 2018, September. Liquid distribution and hold-up measurement in counter current flow packed column by electrical capacitance tomography. *9th World Congress on Process Tomography*, Bath, UK.
- [5] **Yang, Y.**, Wu, H., Jia, J., 2018, June. Quasi-2D EIT-optical Dual Modality Sensor for Cellular Imaging. *19th International Conference on Biomedical Applications of Electrical Impedance Tomography*, Edinburgh, UK.
- [6] Wu, H., **Yang, Y.**, Jia, J., 2018, June. 3D cell spheroids drug response monitoring using electrical impedance tomography. *19th International Conference on Biomedical Applications of Electrical Impedance Tomography*, Edinburgh, UK.
- [7] **Yang, Y.**, Wu, H., Jia, J., 2017, October. Simulation Study of Scaffold 3D Cell Culture Imaging Using a Miniature Planar EIT Sensor. *2017 IEEE International Conference on Imaging Systems and Techniques (IST)*, Beijing, China.
- [8] Wu, H., **Yang, Y.**, Bagnaninchi, P., Jia, J., 2017, October. Imaging cell-drug response in 3D bioscaffolds by electrical impedance tomography. *2017 IEEE International Conference on Imaging Systems and Techniques (IST)*, Beijing, China. (**Best Student Paper Award**)
- [9] Yin, X., **Yang, Y.** and Jia, J., 2017, October. 3D Image Reconstruction on a Miniature Planar EIT Sensor Using Sparsity with Median Filter. *IEEE Sensors 2017*, Glasgow, Scotland, UK.
- [10] Jamil, N., **Yang, Y.**, Tsiamis, A., Jia, J. and Smith, S., 2017, October. Comparison of Regularisation Methods in Image Reconstruction for Micro-Bioimpedance Tomography. *IEEE Sensors 2017*, Glasgow, Scotland, UK.
- [11] **Yang, Y.**, Jia, J., 2017, June. Total Variation and l_1 Joint Regularization for High Quality Cell Spheroid Imaging Using EIT. *18th International Conference on Biomedical Applications of Electrical Impedance Tomography*, New Hampshire, USA.
- [12] **Yang, Y.**, Jia, J., 2017, June. Optimal Design of a Planar Miniature EIT Sensor for 3D Cell Imaging. *18th International Conference on Biomedical Applications of Electrical Impedance Tomography*, New Hampshire, USA.
- [13] Jamil, N., **Yang, Y.**, Smith, S., Jia, J., Bagnaninchi, P., & González-Fernández, E., 2016, December. Design and fabrication of microelectrodes for electrical impedance tomography of cell spheroids. *2016 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES)*, Malaysia.
- [14] **Yang, Y.**, Jia, J., 2016, September. Image Reconstruction Algorithm for Electrical Impedance Tomography

Using Group Sparsity. *8th World Congress on Process Tomography*, Iguassu Falls, Brazil.

- [15] Fisher, E., **Yang, Y.**, Ouypornkochagorn, T., Chighine, A., and etc., 2016, September. Data Acquisition for Multi-Channel CST of Aero-Engine Exhaust Plume Species and Combustion Diagnostics. *8th World Congress on Industrial Process Tomography*, Iguassu Falls, Brazil.
- [16] **Yang, Y.**, Jia, J., McCann, H., 2015, September. A faster measurement strategy of electrical capacitance tomography using less sensing data. *2015 IEEE International Conference on Imaging Systems and Techniques (IST)*. Macro, China.
- [17] **Yang, Y.**, Peng, L., and Jia, J., 2015, September. A novel sensing strategy for electrical capacitance tomography. *7th International Symposium on Process Tomography, Dresden, Germany*.
- [18] **Yang, Y.**, Jia, J., Polydorides, N., McCann, H., 2014, October. Effect of structured packing on EIT image reconstruction. *2014 IEEE International Conference on Imaging Systems and Techniques (IST)*. Santorini, Greece.
- [19] **Yang, Y.**, Fan, Z., Gao, R., 2014, June. Optimal battery control strategy for wireless sensor networks with solar energy supply. In *American Control Conference (ACC), 2014* (pp. 3559-3564). IEEE.
- [20] **Yang, Y.**, Gao, R., Fan, Z., Wang, J., Wang, L., 2014. Cloud-Based Prognosis: Perspective and Challenge. *The 42nd North American Manufacturing Research Conference*. American Society of Mechanical Engineers, Detroit, US. (**Review Paper**)
- [21] Guo, L., **Yang, Y.**, Lei, L., and Peng, L. Characterization of capacitance sensor for the measurement of water droplet in gas. *AIP Conference Proceedings 1592 (1)*, 27-36, 2014.
- [22] **Yang, Y.**, and Peng, L., 2013, October. An image reconstruction algorithm for ECT using enhanced model and sparsity regularization. *2013 IEEE International Conference on Imaging Systems and Techniques (IST)*, Beijing, China.
- [23] **Yang, Y.**, and Peng, L., 2013. An image reconstruction algorithm for high-contrast dielectrics in ECT. *7th World Congress on Process Tomography*, Poland.
- [24] **Yang, Y.**, and Peng, L., 2012, July. A digital and analog mixed electrical capacitance tomography system using combining electrode strategy. *2012 IEEE International Conference on Imaging Systems and Techniques (IST)*, Manchester, UK.

INVITED TALKS

- Data-driven Agile Tomography for Industrial and Biomedical Imaging
Invited Seminar, Nanjing University of Aeronautics and Astronautics, China 11/2019
- Data-driven Agile Tomography for Industrial and Biomedical Imaging
Invited Seminar, Yangzhou University, China 11/2019
- Agile Tomography for Industrial and Biomedical Imaging
Invited Seminar, Tianjin University, China 06/2019
- 3-D Cell Culture Imaging Using Electrical Impedance Tomography
4th PEIYANG Forum for Young Scholars, Tianjin University, China 12/2017
- 3-D Cell Culture Imaging Using Electrical Impedance Tomography

5th International Young Scholar Forum of Sun Yet-Sen University, China

- Recent Research on Electrical Impedance Tomography and Electrical Capacitance Tomography
Invited Seminar, Beihang University, China 08/2015
- Recent Research on Electrical Impedance Tomography and Electrical Capacitance Tomography
Invited Seminar, North China Electric Power University, China 08/2015

RESEARCH SUPERVISION

- **PhD Students** (as principal supervisor)
 - Mr. Haokun Wang 01/2019 – 12/2022
Big data of multiphase flow measurement for optimizing oil and gas production
 - Mr. Delin Hu 09/2019 – 06/2023
Machine learning for multiphase flow sensing based on multi-modal sensing data
 - Mr. Hafeez Abdul Bari 10/2019 – 07/2023
Artificial intelligence for dynamic production optimization
 - Ms. Zhou Chen 09/2019 – 06/2023
Machine learning aided bioimpedance spectral imaging for tissue engineering
 - Mr. Zhe Liu 09/2019 – 06/2023
Multi-modal imaging for tissue engineering
- **PhD students** (as second supervisor)
 - Mr. Changjiang Liu 09/2018 – 06/2022
- **Visiting PhD students**
 - Mr. Jinxi Xiang, Tsinghua University, China 11/2019 – 09/2020
- **MSc Students**
 - Mr. Zhenyu Jiang 09/2018 – 09/2019
 - Ms. Zhijin Sun 09/2018 – 09/2019
- **Summer Students/Placements**
 - Mr. Vladimir Zolotarev, IAESTE Funded Summer Placement 2019
 - Mr. Keming Lu, Tsinghua University Oversea Programme 2019
- **Internal Examiner Appointments**
 - Dr. Adewale Adetomi, IMNS 2019

TEACHING

- Spring 2019 – Electrical Engineering 1 Tutorial, undergraduate course
- Spring 2020 – Signal Processing and Communications, undergraduate course

SOCIAL SERVICE AND OUTREACH

- **Doctorate Association (DA) (www.doctorateassociation.org), UK** 04/2017 – Present
Served as the Vice President of DA, where my main responsibilities include organizing regular academic seminars for the general public and planning activities for international personnel exchange.

- **UoE School of Engineering Postgraduate Conference** 04/2016
Selected as the only demonstrator of IDCOM to demonstrate my PhD research outcome to the second year postgraduates and other researchers.
- **Edinburgh International Science Festival** 04/2016
Selected as a five-day demonstrator at the National Museum of Scotland to demonstrate my PhD research to the general participants of the science festival.
- **UoE School of Engineering Postgraduate Open Day** 11/2015
Selected as the demonstrator of IDCOM to demonstrate my PhD research to the open day participants.
- **Alumni liaison**, Anhui University, China 07/2010 – Present
Commissioned by the University Alumni Association to actively organize, participate and volunteer alumni events.