JIN XU

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PROFESSIONAL SUMMARY

- Experienced researcher with a strong background in data science, software engineering, bioinformatics engineering and collaboration in machine learning and advanced digital signal processing leading to the successful design of EEG (Electroencephalogram) data processing to support advanced BCI (Brain-Computer Interface) systems, with 3 international conference papers and 2 prestigious journal papers; one of the journal papers was selected as the "Featured Paper" in the January 2022 issue of Electronics Letters.

- Effective and confident communicator, have 3 years of teaching experience, including lectures, labs and exams at the universities, and successful in explaining research ideas to a multi-disciplinary audience through 10+ oral presentations in international conferences.

RELATED EXPERIENCE

Lecturer   Maynooth, Ireland
Department of Electronic Engineering, Maynooth University   Sept. 2022-To Date

- Responsible for a complete module (Analogue Electronics, EE204) at the Department of Electronic Engineering. The module includes 24 hours of lectures and 24 hours of laboratory classes, with exams and markers.

- Supervised 5 lab demonstrators and completed all lab sessions for all 40 students, including grading and providing feedback on students' lab reports.

- Tracked students' progress and prepared class tests, actively receiving feedback from students to adjust the progress of the lectures.

Postdoctoral Researcher   Galway, Ireland
Department of Business Information Systems, University of Galway   Sept. 2022-To Date

- The title of this project is "Video Conferencing Fatigue Analysis using EEG Signals" which involves a series of neurophysiological experiments. These findings of this project can inform the design of web conferencing platforms to limit the negative impacts on user well-being.

- Tasked with leading the delivery of the project's objectives. Key requirements will involve conducting neurophysiological experiments (e.g. EEG, ECG, EMG, EOG), and disseminating the findings in high-quality academic outlets and through industry workshops.

- Responsible for conducting top-quality empirical research with industry partners (e.g. Cisco). Strong industry communication, collaboration and coordination skills to sustain fruitful industry-academic relationships.

- Participated in new research funding opportunities, such as IRC Postdoctoral Fellowship, IRC Enterprise Partnership Scheme and Cisco Research.

PhD Researcher   Dublin, Ireland
School of Electrical and Electronic Engineering, TU Dublin   Feb. 2018-Jun. 2022

- The title of this PhD work is "Time-Resolved Method for Spectral Analysis based on Linear Predictive Coding, with Application to EEG Analysis" which developed a new automatic parameterised time-resolved method called Linear Predictive Coding Pole Processing (LPCPP) for real-time EEG spectral analysis.

- Designed and developed an EEG spectral analysis framework that enables real-time EEG spectral activity tracking and analyse of the dominant EEG spectra distribution in the frequency domain.

- This work will be of significant benefit in the development of BCI applications to help in pushing BCI techniques out of the laboratory. It also has the potential to become a useful general tool in the field of speech analysis, mechanical vibration analysis, seismographic analysis and image analysis.

- Built and expanded my early career network. Actively involved in international cooperation projects, participating in CHIST-EAR consortia and working with partners from industry and academia.

Teaching Assistant   Chengdu, China
School of Information and Software Engineering, UESTC   Sept. 2017-Dec. 2017

- Assisted in the preparation and execution of weekly lab classes for 50+ mater students at the machine learning module and presented 2 lectures.

Lab Demonstrator Chengdu, China
School of Information and Software Engineering, UESTC Feb. 2017-Jun. 2017

- Tutored 50+ undergraduate students in C programming language and demonstrated lab classes and graded lab reports.

LEADERSHIP EXPERIENCE

Student Ambassador Dublin, Ireland
Technological University Dublin May. 2019

- Participated as a student representative in a university visiting group for a collaborative symposium on the establishment of an Irish-Sino cooperative research institution.

- This project provides more opportunities to apply for Chinese and Irish funds and can attract more Chinese students.

President of Student Computer Association Chengdu, China
Southwest Petroleum University Jun. 2014 - Sept. 2015

- Worked with 24 directors in committee and the association had over 100 members in my term. I have been bestowed the title of the "Most Favoured Presidents Honorary" of SWPU.

RESEARCH PROGRAMME APPLICATION EXPERIENCE

IRC Enterprise Partnership Scheme 2022 Nov. 2022

- The title is "Real-Time Video Conferencing Fatigue Monitoring using Multidimensional Bioelectric Signals". This proposal is to apply the knowledge gained from our previous project in order to develop a real-time video conferencing fatigue monitoring system using a series of neurophysiological experiments (e.g. EEG, ECG, EMG, EOG).

Government of Ireland Postdoctoral Fellowship Programme 2022 Oct. 2022

- The title is "Real-time Video Conferencing Fatigue Monitoring using EEG Signals" which will develop a real-time video conferencing fatigue monitoring using EEG signals. This system will enable users to monitor signs of fatigue and take steps to remedy the problem.

Sony Research 2022 Sept. 2022

- The title is "EEG Mouse: A Novel Computer Input Device for Cursor Control" which proposes a new application scenario using a wearable EEG headset as part of a computer input device for cursor control.

Government of Ireland Postdoctoral Fellowship Programme 2021 Oct. 2021

- The title is "An Enhanced LPCPP Method for Real-Time Analysis of EEG Signals to Support BCI" which follows on from my PhD work and its integration into a machine learning-based system to realise a real EEG application.

Sony Research 2021 Sept. 2021

- The title is "Time-Resolved Morphology of EEG Activity using an Enhanced LPCPP Method" which develops a real-time monitoring system for EEG dominant frequency tracking.

CHIST-ERA Consortium Mar. 2021

- Participated in an application for an international cooperation project (including researchers from Hungary, Poland, and Turkey) and submitted a research proposal titled "Non-invasive brain-computer interfaces powered by non-hardware-specific and symbiotic artificial intelligence" for the CHIST-ERA programme - Advanced Brain-Computer Interfaces (BCI) for Novel Interactions.

EDUCATION

Technological University Dublin (TU Dublin) Dublin, Ireland
PhD in Electronic and Electrical Engineering Feb. 2018 - Jun. 2022

University of Electronic Science and Technology of China (UESTC) Chengdu, China
PhD in Software Engineering Sept. 2016 - Dec. 2017

Southwest Petroleum University (SWPU) Chengdu, China
Bachelor in Computer Science and Technology Sept. 2012 - Jun. 2016
Bestowed the title of the "Outstanding Graduate"

ACADEMIC AWARDS

- Technological University Dublin Scholarship   2019
- Higher Education Authority Government of Ireland International Education Scholarship   2018

SKILLS

Languages: Professional proficiency in English language.

Methodological Skills: Machine Learning, Advanced Digital Signal Processing, Time-Series Data Analysis, Time-Frequency Analysis, Feature Selection, Interdisciplinary Research, Biomedical Engineering, Recommendation System.

Computer/Technical Skills: Python, MATLAB, C, C++, PHP, Java, TensorFlow; SQL, GitHub, Linux, LaTeX, etc.

Interests: Video Games, Hiking, Reading, Physics, Research.

PUBLICATIONS

1. Jin Xu, Mark Davis, and Ruairí de Fréin. "Dominant Frequency Component Tracking of Noisy Time-varying Signals using the Linear Predictive Coding Pole Processing Method." Electronics Letters (2022).

* This paper was selected as a "Featured Paper" in the issue of Electronics Letters.

2. Jin Xu, Mark Davis, and Ruairí de Fréin. "A Linear Predictive Coding Filtering Method for the Time-resolved Morphology of EEG Activity." 32nd Irish Signals and Systems Conference. IEEE, 2021.

3. Jin Xu, Mark Davis, and Ruairí de Fréin. "An LPC Pole Processing Method for Enhancing the Identification of Dominant Spectral Features." Electronics Letters (2021).

4. Jin Xu, Mark Davis, and Ruairí de Fréin. "New Robust LPC-Based Method for Time-resolved Morphology of High-noise Multiple Frequency Signals." 31st Irish Signals and Systems Conference. IEEE, 2020.

5. Jin Xu, Mark Davis, and Ruairí de Fréin. "A Robust LPC Filtering Method for Time-Resolved Morphology of EEG Activity Analysis." 26th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland (2020).

6. Jin Xu, Mark Davis, and Ruairí de Fréin. "An Uncertainty Principle Analysis for Parameterisation Time-frequency Method." IEEE Transactions on Signal Processing (In Preparation, 2022).

7. Jin Xu, Mark Davis, and Ruairí de Fréin. "Analysis of the Estimation Bias and Time-Bandwidth Product for a Linear Predictive Coding Pole Processing Algorithm" IEEE/ACM Transactions on Computational Biology and Bioinformatics (In Preparation, 2022).

8. Jin Xu, Mark Davis, and Ruairí de Fréin. " EEG Centre Frequency Analysis using Linear Predictive Coding Pole Processing Method" IEEE Transactions on Biomedical Circuits and Systems (In Preparation, 2022).

* The following are the publications published in Chinese academic journals during my undergraduate period:

9. Jin Xu, 2014. The first program of the Android development process. Science and Technology Information, (29), pp.20-20. Publisher: Beijing Academy of Science and Technology.

10. Jin Xu, Shan Shu and Xing Zhao, 2015. Improvement of RDP protocol based on VDI virtual desktop. Digital Technology and Application, (7), pp.58-58. Publisher: Tianjin Institute of Electronic Instrument Information.

11. Shu Shan, Jin Xu and Xiang Haiyun, 2015. Analysis of the development and application of virtual desktop transfer protocol. Technology Wind, (12), pp.106-106. Publisher: Hebei Science and Technology Association.

12. Li Guodong and Jin Xu, 2015. Design of remote monitoring and fireproof and moisture-proof system based on ZigBee and GPRS protocol. Technology Innovation and Application, (23), pp.83-83. Publisher: Heilongjiang Science and Technology Association.

13. Zhao Xin, An Rongtong and Jin Xu, 2015. Security research based on desktop virtualization. Network Security Technology and Application, (5), pp.154-155. Publisher: Peking University Press.