Marco Vinicio Alban-Paccha, PhD, FHEA

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Engineer, scientist, and educator committed to shaping the future of healthcare and human-machine interfaces by creating sensing technologies that seamlessly connect the physical and digital worlds, thinking across every layer from material foundations to intelligent systems.

RESEARCH AND ACADEMIC APPOINTMENTS

2025 – present | **Postdoctoral Research Associate**
Department of Engineering, University of Cambridge, Cambridge, UK
Bioelectronics Laboratory. Supervisor: Prof George Malliaras
Leading the translational development of a wearable device employing ML techniques for detecting biomarkers indicative of concussion and other neurological disorders. The project is conducted in collaboration with the Department of Clinical Neurosciences. Key responsibilities include:
- Develop sensor fusion and computer vision algorithms to detect neurological biomarkers in wearable platforms.
- Integrate sensing hardware, optimized data acquisition, and low-cost designs for clinical and field deployment.
- Coordinate interdisciplinary teams spanning engineering, neuroscience, and clinical research.
- Lead intellectual property strategy and technology commercialisation efforts in collaboration with Cambridge Enterprise.

2022 – 2025 | **Postdoctoral Research Associate**
Department of Engineering, University of Cambridge, Cambridge, UK
Bioelectronics Laboratory. Supervisor: Prof George Malliaras
Led the translational development of a wearable Organic Electrochemical Transistor (OECT)-based platform for multi-modal sweat sensing. Key responsibilities included:
- Designed and characterised OECT-based electrochemical sensors to measure ions and hormones.
- Integrated the electrochemical sensors with corresponding signal analysis electronics as well as communication and power modules and optimizing for low-cost.
- Structured the Intellectual Property of the electronics part of the project to facilitate global impact through open sourcing the technology, enabling adoption and further validation.

Department of Medicine, University of Cambridge, Cambridge, UK
Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
Division of Anaesthesia. Supervisors: Prof Geoff Woods and Dr Nicholas Shenker
Led the wearable electronics and mobile apps arm of the ADVANTAGE study to understand visceral pain, as part of the ADVANTAGE pain consortium within the UK's Advanced Pain Discovery Platform. Key responsibilities included:
- Managed the acquisition, storage, and allocation of the data from all sites as the **Study Data Manager**.
- Configured and administered specialized tools (software and hardware) required for quantitative physiological measurements in healthy volunteers and hospital patients.
- Developed ML-powered solutions (on-device and cloud-based) to detect, acquire, store, and analyse patient health data, to dynamically classify their response and correlate it with their pain levels.
- Led the preparation and submission of NHS Ethics applications through IRAS platforms, including writing Patient Information Sheets, Standard Operating Procedures, and Case Report Forms.
- Interacted with NHS patients to maximize the compliance of wearable sensor usage.
- Liaised with institutional legal teams in the NHS Trust and the University to establish intra-consortium agreements for the transfer of data, samples, and equipment.

2022 – present | **Associate Lecturer**
The Open University, Milton Keynes, UK
Faculty of Science, Technology, Engineering and Mathematics. Line Manager: Rosemary Boltryk
Responsible for enhancing student learning experiences and outcomes through tailored academic support, pastoral care, and mentorship. Key responsibilities include:
- Deliver personalized academic support and feedback to undergraduate engineering students.
- Foster inclusive learning environments by identifying and addressing individual student needs.
- Promote transferable skills development and guide students' academic and professional growth.
- Monitor and evaluate academic progress to enhance student engagement and success.

2023 – present | **Postdoctoral By-Fellow**
Churchill College, Cambridge, UK
Mentor for postgraduate students in the College, providing academic guidance, career advice, and personal support.

2023 – present | **Faculty Mentor**
Cambridge Centre for International Research (CCIR), Cambridge, UK
Cambridge Future Scholar Programme and 1-on-1 Mentoring Programme

The Future Scholar Programme is an online research-focused programme for students. Key responsibilities include:
- Providing lectures and supervision to students.
- Guiding students through the process of original research in their chosen discipline.
- Offering feedback on student work and progress, helping them to refine their research skills and understanding of the subject matter.

2022   **Lecturer**
Universidad de las Américas – UDLA, Ecuador
Faculty of Online Studies. Line Manager: Dr Andres David Navas
Collaborated on the foundation and design of the 'Principles and Strategies in Artificial Intelligence' Online Diploma Program, the first fully online AI diploma in Ecuador. Key responsibilities included:
- Designed and delivered course modules on artificial intelligence concepts, focusing on applied machine learning and system integration.
- Developed curriculum and lecture materials tailored for professional upskilling in AI technologies.
- Created practical assignments and coding exercises to bridge theory and real-world applications across healthcare, engineering, and business sectors.

EDUCATION

2018 – 2022   **Doctor of Philosophy (PhD) Degree in Electrical Engineering**
Korea Advanced Institute of Science and Technology – KAIST, Daejeon, Korea
Integrated Organic Electronics Laboratory – IOEL. Supervisor: Prof Seunghyup Yoo
Thesis: Applications of Flexible Dry Electrodes in Biopotential-based Real-time Cardiac Monitoring. Key responsibilities included:
- Developed biocompatible micro-structured dry electrodes for bioelectric potentials.
- Designed the circuitry necessary for close-to-heart ECG and PPG measurements.
- Implemented a mobile application to display ECG, PPG and derived calculated measurements in real-time from a close-to-heart sensor.

See-through Phototherapy Platform for Circadian Rhythm Sleep Disorders. Tasks included:
- Developed a transparent light waveguide based on holographic gratings ready to mount on regular glasses.
- Analysed and optimized a plane-to-point waveguide to increase the luminance of an OLED light source.

2016 – 2018   **Master in Engineering (MEng) Degree in Micro/Nano Systems**
Korea University, Seoul, Korea
Display and Nanosystems Laboratory – DIANA. Supervisor: Prof Byeong-Kwon Ju
Thesis: Optimization of Electron Injection in Organic Light Emitting Diode (OLED) Devices Using Alkali Metal Compounds. Key responsibilities included:
- Designed and conducted experimental studies on alkali metals as electron injection layers, demonstrating enhanced charge transport and device efficiency in OLED architectures.

2006 – 2013   **Engineer (BEng) Degree in Mechatronics**
University of the Armed Forces – ESPE, Sangolquí, Ecuador
Final Year Project at the Computer Integrated Manufacture Laboratory – CIM-2000. Supervisor: Dr Alejandro Chacón
Thesis: Design and Implementation of a SCADA System for Remote Operation of Manufacturing Stations via Internet2. Key responsibilities included:
- Developed a small-scale Supervisory Control and Data Acquisition (SCADA) system and accompanying documentation for the laboratory's manufacturing stations.
- Led the integration of Internet2 technology to enable remote control of manufacturing processes, in collaboration with the Monterrey Institute of Technology and Higher Studies (ITESM), Mexico.

2014 – 2016   **Korean Language Student**
Pai Chai University, Daejeon, Korea

2010   **Visiting Exchange Student**
Monterrey Institute of Technology and Higher Studies – ITESM, Monterrey, Mexico

TEACHING AND SUPERVISION EXPERIENCE

2022 – present   **Lecturer, T366 Nanoscale Engineering, The Open University**
Design and deliver 'Health Applications of Nanoscale Engineering' lectures, integrating cutting-edge research with student learning (38 students between 2022–2024, 22 students for 2024–2025). Support student learning through continuous feedback and assessment of coursework and project deliverables.

2023 – present   **Lecturer, T452 The Engineering Project, The Open University**
Supervise final-year engineering projects with a focus on nanoscale systems, guiding students through research planning, execution, and technical reporting (12 students between 2023–2024, 8 students in 2025 working on Nanoscale Engineering Projects).

2022 – present	**Supervisor, Part IA Computing, Homerton College, University of Cambridge** Lead small-group tutorials (supervisions) for first year Engineering students, covering core computing and programming concepts (40 students between 2022–2024, 19 students in 2024–2025). *Supervision* is the University of Cambridge name for a small group tutorial.
2023 – present	**Tutor, Nanoscale and Nanoengineering, CCIR** **Tutor, Sensors in Wearable Technology, CCIR** **Mentor, 1-on-1 Program, CCIR** Design and teach research-based courses on wearable sensors and nanoscale engineering for advanced high school and undergraduate students. Mentor students in developing independent research projects, emphasizing critical thinking, technical writing, and scientific communication.
2023 – 2024	**Academic Support Tutor, Part IA Computing, University of Cambridge** Provided technical support and tutoring for over 600 first-year Engineering students through Help Desk sessions during 2 Michaelmas terms between 2023 and 2024. Assisted in the evaluation and grading of programming assignments to reinforce key computational skills.
2022	**Lecturer, Intelligent Systems, Universidad de las Américas – UDLA, Ecuador** Designed and delivered a full lecture series for an Artificial Intelligence diploma course, pioneering Ecuador's first online AI program.
2012 – 2013	**Laboratory Assistant, Computer Integrated Manufacture Laboratory, University of the Armed Forces – ESPE** Guided students through PLC programming and HMI design for manufacturing automation capstone projects.
2011	**Laboratory Assistant, Mechanics and Mechatronics Instrumentation, University of the Armed Forces – ESPE** Developed and implemented hands-on experiments in sensor characterization and data acquisition using LabVIEW for undergraduate courses.

PUBLICATIONS AND MANUSCRIPTS

Dr Alban-Paccha's publications are listed below, including peer-reviewed articles, manuscripts under review, and works currently in preparation. Online links are provided where available. (‡ Joint first authorship, * Corresponding authorship)

1. Olsen, E., Gatecliff, L., Güemes, A., **Alban-Paccha, M.V.**, and Malliaras, G.G.* (2025). *OECT-based Sensor Platform for the Simultaneous Detection of Cortisol and Adrenaline from Interstitial Fluid*. In Preparation.

2. Gatecliff, L.‡, **Alban-Paccha, M.V.**‡, and Malliaras, G.G.* (2025). *Multi-Functional Electronic Interface with Mobile Integration*. In Preparation.

3. **Alban-Paccha, M.V.**, Teran-Perez, J., Gul, U., Shenker, N., Malliaras, G.G., and Woods, C.G.* (2025). *Enhancing Clinical Research Outcomes with Wearable Sensors: Compliance, Accuracy, and Stakeholder Perspectives with Pilot Data from the ADVANTAGE Consortium*. In Preparation.

4. **Alban-Paccha, M.V.**‡, Gatecliff, L.‡, Kissovsky, S., Slaughter, C., Ruiz-Mateos Serrano, R., Keene, S.T., Han, S., and Malliaras, G.G.* (2025). *Multimodal Transistorized Wearable Electrochemical Sensor Platform for Ion and Enzyme Analysis*. npj Flexible Electronics, Collection on Organic Electrochemical Transistors. Invitation. Submitted.

5. **Alban-Paccha, M.V.**, Jacobson, G., Moon, H., Malliaras, G.G.*, and Yoo, S.* (2025). *A Wearable Sensor Platform for Lightweight Cuffless Continuous Cardiovascular Monitoring*. Scientific Reports, Collection on Wearable Devices. Invitation. Submitted.

6. **Alban-Paccha, M.V.***, Shenker, N., Teran-Perez, J., Horne, A.W., Malliaras, G.G., Woods, C.G., and the ADVANTAGE Consortium (2025). *ADVANTAGE: Advanced Discovery of Visceral Analgesics by Neuroimmune Targets and the Genetics of Extreme human phenotype, a study protocol*. PLOS One. Submitted.

7. Tao, X., Carnicer Lombarte, A., Dominguez Alfaro, A., Gatecliff, L., Zhang, J., Bidinger, S., Keene, S.T., Naegele, T.E., El Hadwe, S., Dong, C., Boys, A.J., Slaughter, C., Ruiz-Mateos Serrano, R., **Alban-Paccha, M.V.**, Kar-Narayan, S., and Malliaras, G.G.* (2025). *Cleanroom-Free Toolkit for Integrating Submicron-Resolution Bioelectronics on Flexibles*. Small, https://doi.org/10.1002/smll.202411979

8. Serrano, R. R-M., Aguzin, A., Mitoudi-Vagourdi, E., Tao, X., Naegele, T., Jin, A., Lopez-Larrea, N., Picchio, M.L., **Alban-Paccha, M.V.**, Minari, R.J., Mecerreyes, D., Dominguez-Alfaro, A.*, and Malliaras, G.G.* (2024). *3D Printed PEDOT:PSS-based Conducting and Patternable Eutectogel Electrodes for Machine Learning on Textiles*. Biomaterials, https://doi.org/10.1016/j.biomaterials.2024.122624

9. **Alban, M.V.**, Lee, H., Moon, H., and Yoo, S.* (2021). *Micromolding Fabrication of Biocompatible Dry Micro-Pyramid Array Electrodes for Wearable Biopotential Monitoring*. IOP Flexible and Printed Electronics, https://doi.org/10.1088/2058-8585/ac3561

10. Lee, H., Lee, W., Lee, H., Kim, S., **Alban, M.V.**, Song, J., Kim, T., Lee, S., and Yoo, S.* (2021). *Organic–Inorganic Hybrid Approach to Pulse Oximetry Sensors with Reliability and Low Power Consumption*. ACS Photonics, https://doi.org/10.1021/acsphotonics.1c01161

CONFERENCE PRESENTATIONS AND POSTERS

Dr Alban-Paccha has actively presented his research at international conferences and symposia, delivering both oral and poster presentations. His contributions span topics in wearable sensors, bioelectronics, flexible electronics, and translational healthcare technologies. (‡ Joint first authorship)

1. **Alban-Paccha, M.V.**, Shenker, N., Woods, C.G., and Malliaras, G.G. *Predicting Pain Flares from Wearable Sensor Data and Patient Reports: Initial Insights from the ADVANTAGE Study*. Oral presentation at the 18th International Symposium on Flexible Organic Electronics ISFOE25, Thessaloniki, Greece, 9 July 2025.

2. Cullen, K.‡, **Alban-Paccha, M.V.**‡, Woods, C.G., Malliaras, G.G., and Shenker, N. *Visually Understanding Chronic Visceral Pain: Results from the ADVANTAGE UK National Survey on Visceral Pain*. Poster presentation at the 2025 APDP Annual Conference, Newport, Wales, 3 June 2025.

3. **Alban-Paccha, M.V.**, Teran-Perez, J., Shenker, N., Woods, C.G., and Malliaras, G.G. *Wearable Sensors and Mobile App Data for the Modelling and Classification of Visceral Pain*. Oral presentation at the 17th International Symposium on Flexible Organic Electronics, Thessaloniki, Greece, 4 July 2024.

4. **Alban-Paccha, M.V.**, Teran-Perez, J., Shenker, N., Woods, C.G., and Malliaras, G.G. *Wearable Sensors and Mobile App Data for the Modelling and Classification of Visceral Pain*. Invited oral presentation at the 'Can Cancer be Detected Earlier by Employing Wearable Technologies?' symposium organised by the Early Cancer Institute and Precision Health Initiative, Cambridge, UK, 20 October 2023.

5. **Alban, M.V.**, Lee, H., Moon, H., and Yoo, S. *Biocompatible Microneedle Array Dry Electrodes for Bioelectric Potentials Measurement in Organic-Electronic Wearable Health Monitoring Applications*. <u>Best Poster Award Nominee</u> at MRS Fall 2019, Boston, USA, 4 December 2019.

6. **Alban, M.V.**, Lee, H., Moon, H., and Yoo, S. *Flexible and Fully Biocompatible Microneedle Array Dry Electrodes for Bio Potentials Measurement in Organic Electronic Wearable Healthcare Applications*. Poster presentation delivered at Electronic Materials and Nano Technology for Green Environment ENGE 2018, Jeju, Korea, 19 November 2018

7. **Alban, M.V.**, Choi, J., Jung, S.G., Shim, Y.S., Park, Y.W., and Ju, B.K. *Comparative study of different alkali metal compounds as efficient electron injection materials in OLED devices*. <u>Best Poster Award</u> at the Workshop on Photophysics and Nanomaterials WONPHYS 2017, Varadero, Cuba, 27 September 2017.

INVITED TALKS AND ACADEMIC OUTREACH

Through invited talks at academic institutions, hospitals, and international workshops, Dr Alban-Paccha has shared insights into the future of wearable sensing, mobile health technologies, and translational bioelectronics, fostering interdisciplinary collaboration and innovation.

May 2025 **Aristotle University of Thessaloniki, Thessaloniki, Greece**
Presented the talk "Multimodal Transistorized Wearable Electrochemical Sensor Platform for Ion and Enzyme Analysis" to an audience of 40. Talk was the kick-start of a visit to the Nanotechnology Lab LTFN to develop the technology using printing techniques.

April 2024 **University of Edinburgh, Edinburgh, UK**
Presented the talk "Wearable Sensors and Mobile App Data for the Modelling and Classification of Visceral Pain Flares" to an audience of 30, at the ADVANTAGE General Annual Meeting.

October 2023 **Early Cancer Institute, Cambridge, UK**
Presented the talk "Wearable Sensors and Mobile App Data for the Modelling and Classification of Visceral Pain Flares" to an audience of 50, at the "Can Cancer be Detected Earlier by Employing Wearable Technologies?" Workshop.

July 2023 **Addenbrooke's Hospital, Cambridge, UK**
Presented the ADVANTAGE consortium research work on wearables and mobile apps for visceral pain to an audience of 50, including NHS clinicians. Talk generated contacts and offers of collaboration with various clinical specialists.

June 2023 **KAIST, Daejeon, Korea**
Presented the ADVANTAGE consortium research work on wearables and mobile apps for visceral pain and plans for collaboration with the Department of Electrical Engineering of KAIST.

June 2023 **POSTECH, Pohang, Korea**
Presented the ADVANTAGE consortium research work on wearables and mobile apps for visceral pain and plans for collaboration with the Department of Materials Science & Engineering of POSTECH.

This culminated in the visit of Mr Seungjin Chai, doctoral student in POSTECH for a 6-month visit to Cambridge.

July 2022	**Embassy of the Republic of Korea in Ecuador, Quito, Ecuador** Presented the academic experience and research results after the competition of the Korean Government Scholarship. Talk generated contacts and interest for future GKS scholars.
February 2020	**San Francisco de Quito University – USFQ, Quito, Ecuador** SWIFT Talk. Briefly presented my work and how the school can benefit from the skill transfer of Korea-trained researchers. The talk generated the first contact towards a collaboration MOU between USFQ and KAIST.
February 2020	**Armed Forces University – ESPE, Sangolquí, Ecuador** Invited to give a *Masterclass* on the topic of Organic Electronics to professors and senior students at the School of Engineering. The talk generated interest in collaboration for the fabrication of low-cost organic electronics in developing countries.

GRANTS, FELLOWSHIPS, AND FUNDING AWARDS

Dr Alban-Paccha has contributed significantly to securing research funding through original project proposals, interdisciplinary collaborations, and strategic planning. He has led and supported grant management activities, including technical reporting, project coordination, milestone planning, and research budgeting, across academic and clinical research environments.

As Co-Investigator

2023	CAPE Grand Challenge – Systems and Devices for Healthcare 2023 (Malliaras, Alban-Paccha). Granted £50,000.00 for salary and research expenses by Haleon from 12/2023 to 05/2024. Wrote proposal and held multiple meetings with company representatives.

As Investigator and Data Manager

2022 – present	MICA ADVANTAGE visceral pain consortium: Advanced Discovery of Visceral Analgesics via Neuroimmune Targets and the Genetics of Extreme human phenotype (Woods). £4,101,154.00 by the Medical Research Council as part of UK Research and Innovation from 06/2022 to 05/2026.

As Scholar

2018 – 2022	Attachable Photo Therapeutics Centre for e-Healthcare (Yoo). Granted tuition, salary and research expenses by the Ministry of Science and ICT of Korea from 03/2018 to 02/2022.
2014 – 2018	Korean Government Scholarship Program, now known as the Global Korea Scholarship (Alban-Paccha). Granted tuition and salary by the Ministry of Education of Korea from 09/2014 to 02/2018.

Pending

2025	Predictive Analytics for Personalized Visceral Pain Control: A Pilot Study Using ADVANTAGE Data (Alban-Paccha). Requested £50,000.00 for salary and research expenses from the Annabels Foundation from 11/2025 to 10/2026. Wrote proposal and held multiple meetings with stakeholders.

STUDENT MENTORING AND RESEARCH SUPERVISION

Dr Alban-Paccha has actively mentored undergraduate, master's, and visiting students within Prof. George Malliaras' research group at the University of Cambridge. Although not formally listed as a co-advisor, he has played a critical role in shaping research directions, providing technical guidance, supporting experimental work, and advising on data analysis. His mentorship has contributed to multiple student-led publications and to the advancement of students' academic and professional careers.

Doctoral Candidates

2022 – present	Luke Gatecliff. Engineering. Project: OECT-based Ion Sensors for Athletics and Healthcare
2023 – present	Christopher Slaughter. Engineering. Project: Biopotential Gastric Movement Measurement Platform
2024 – present	Kieran Cullen. Medicine. Project: Analysis of Body-Map dataset from the ADVANTAGE Pain Survey

4th Year Students (Master's degree Candidates)

2023 – 2024	Gemma Jacobson. Engineering. Project: Cuffless Biopotential-Based Blood Pressure Estimation

Undergraduate Students (Summer Internship)

2025	Bartosz Zygowski. Engineering. Project: Optimisation of Integrated Microfluidic Devices

Visitor Students/Researchers

2025	Cristiano Bortolotti, Polytechnic University of Milan, Italy
2023	Seungjin Chai, POSTECH, Korea

PROFESSIONAL TRAINING AND CERTIFICATIONS

To support his interdisciplinary research and educational activities, Dr Alban-Paccha has undertaken professional training in university-level teaching, online learning design, research ethics, clinical governance, and technology commercialization. This diverse development reflects his commitment to excellence in academic leadership, innovation, and responsible research.

2025   **Fellow of the Higher Education Academy of the UK**
Advance HE, United Kingdom
Recognized as a Fellow of the Higher Education Academy (FHEA) in the UK for a commitment to excellence in teaching and learning in higher education. This fellowship reflects a deep understanding of effective teaching practices, including curriculum design, student engagement, and inclusive education. It highlights a dedication to supporting student learning through evidence-based approaches and fostering an enriching educational experience.

2023   **EnterpriseTECH**
Judge Business School, University of Cambridge
Completed the EnterpriseTECH programme at Cambridge Judge Business School, focused on commercializing STEM innovations, strategic project management, and interdisciplinary teamwork.

2024   **Learning to Teach Online**
University of New South Wales (UNSW Sydney) via Coursera
Completed a structured course on designing, delivering, and evaluating effective online and hybrid learning experiences, with emphasis on learner engagement and pedagogical strategies.

2023   **Clinical Research Governance Training**
University of Cambridge and NHS Cambridge University Hospitals
Trained in Good Clinical Practice (GCP) principles, ethical submission processes, and clinical research management for NHS-regulated studies.

2022   **Research Integrity and Ethics Training**
University of Cambridge
Completed mandatory research integrity course covering responsible research practices, data management, authorship ethics, and research governance.

2022   **Problem-Based Learning (PBL) Supervision Training**
University of Cambridge
Gained specialized experience supervising and mentoring undergraduate students in problem-based learning courses, fostering critical thinking, independent research skills, and applied problem-solving.

SERVICE TO THE ACADEMIC COMMUNITY

Beyond research and teaching, Dr Alban-Paccha is committed to strengthening the academic community through peer review, student mentorship, public engagement initiatives, and leadership roles in professional organizations. His service work reflects a dedication to advancing interdisciplinary collaboration and fostering inclusive research cultures.

2024 – present   **PPI for Neurotech Initiative, Cambridge, UK**
Administrator and planner of coordination meetings and PPI panels with charities Parkinson's UK and McPin.

2023 – present   **Churchill College, Cambridge, UK**
Mentor for postgraduate students at the College.

2023 – present   **Flexible and Printed Electronics, Institute of Physics**
Reviewer of papers for the journal.

2023 – present   **Nanotechnology, Institute of Physics**
Reviewer of papers for the journal.

2023 – 2024   **IEEE International Conference on Flexible and Printable Sensors and Systems**
Reviewer of papers for the conference.

2019 – 2020   **Electrical Engineering International Students Council, KAIST, Daejeon, Korea**
Council Head. Organized events for the international community of students in KAIST campus.

2017 – 2018   **School of Engineering International Students Group, Korea University, Seoul, Korea**
Vice-President. Organized events for the international community of students in Korea University campus.

2017 – 2018   **Ecuadorian Residents in Korea Association, Seoul, Korea**
Co-Founder and President. Collaborated with the organization of the legal framework for the Association to be recognized by the Korean Government, as well as represented the Ecuadorian community in diverse events.

TECHNICAL SKILLS AND RESEARCH COMPETENCIES

Languages: Fluent in English and Spanish; proficient in Korean; basic understanding of Japanese and Portuguese.

Research and Collaboration: Analytical, collaborative, and results driven. Extensive experience in electronic and biomedical device design and manufacturing, with a strong focus on translational research. Skilled in communicating complex ideas effectively through presentations, technical documentation, and interdisciplinary collaboration.

Technical Expertise: Advanced knowledge of electronic, electromechanical, and mechatronic systems. Proficient in designing and implementing sensors, signal processing techniques, communication protocols, and low-power electronic systems.

Experimental Techniques: Hands-on experience with photolithography, furnace annealing, plasma treatment, sputtering, thermal evaporation, SEM, AFM, surface profiling, and electrochemical deposition.

Design and Simulation: Strong Computer-Aided Design (CAD) skills with tools such as SolidWorks, AutoCAD, Inventor, and COMSOL. Expertise in electronic design, analysis, and PCB fabrication using Eagle, Altium Designer, and Proteus Suite.

Programming and Data Analysis: Proficient in programming languages and tools including Python, C/C++, Java, LabVIEW, MATLAB, and LaTeX. Experienced in integrating embedded systems, developing algorithms for AI/ML applications, and analysing multimodal sensor data.

Software and Systems: Skilled in Linux/Windows operating systems, Microsoft Office, and web technologies (HTML/CSS/JS). Familiar with smartphone app development and IoT integration for wearable and implantable devices.

Teaching and Mentorship: Recognized as a Fellow of the Higher Education Academy (FHEA). Experienced in teaching engineering courses and supervising student projects. Skilled in creating engaging learning environments and mentoring diverse student groups.

Soft Skills: Strong problem-solving abilities, adaptability, and creativity. Proven track record in delivering innovative solutions for complex challenges in research and development.