

# Dr Hassan Zaidi

PhD, CEng, MIET, CMath, CSci, MIMA, PGCE, MSc, BSc (Hons)

zaidi.apply@gmail.com

## Professional Certification

**Awarded 2023**

**Chartered Engineer**

**The Institution of Engineering and Technology**

For developing engineering solutions using new and existing technologies through innovation, creativity and having technical accountability for complex systems with significant levels of risk.

**Awarded 2021**

**Chartered Scientist**

**The Science Council**

For demonstrating effective leadership, using my specialist knowledge and broader scientific understanding to develop and improve the application of science and technology by scoping, planning and managing multifaceted projects.

**Awarded 2021**

**Chartered Mathematician**

**The Institute of Mathematics and its Applications**

Demonstrated high levels of professionalism and competence in mathematics and my commitment to keep pace with advancing knowledge in mathematics and its applications.

## Experience

**2022-present**

**Principal Data Scientist**

**BAE Systems**

**Artificial Intelligence Science Advisor to the Ministry Of Defence**

Within the Defence Artificial Intelligence Centre (DAIC), I am the technical expert and artificial intelligence science advisor across MOD projects. I leverage my expertise to establish and technically support the development of solutions for the Army, Royal Navy and RAF based on stakeholder problems and requirements. Such examples include the development of a technology stack to allow improved object detection from satellite imagery or advanced document scanning methods.

**Technical Authority**

I manage, undertake, review, approve and certify engineering activities at a management level. I am enrolled in a year-long training program within BAE Systems to become a BAE Systems Technical Authority, where I will be a technical owner for £million+ sub-systems and projects. In this program I am undertaking extended sponsored study, including university courses such as System Safety Engineering and Model-Based Systems Engineering at the University of York. This allows me to make safe, effective Artificial Intelligence-related and general engineering decisions at a management level.

**Artificial Intelligence Expert**

I am tasked with identifying new opportunities to enable AI technologies within multi-domain platforms that spread from seabed, sea, land, air and space. I lead medium-sized teams and help drive technological innovation. For example, I have identified predictive maintenance opportunities for mobile networks for Defence, identifying the constraints for both the development and use of the platform in theatre. We have iterated and developed prototypes and first-in-class solutions using an agile work strategy. Given the commercial advantages of the new AI technology stack and the domain I work in, I am acutely aware of the need to secure the IP rights and export controls necessary to retain the company's advantage.

**2023-present**

**Postdoctoral Research Fellow**

**King's College London**

**Machine Learning & Advanced Digital Twin Cardiac Modelling**

Funded by the British Heart Foundation, I develop novel ways to predict individual patient risk of lethal ventricular arrhythmias and Sudden Cardiac Death for a large cohort of patients in the Guys & St Thomas' NHS Hospital Trust and the Royal Brompton & Harefield NHS Hospital Trust.

**2019-2021**

**Senior Data Scientist**

**DSTL**

**Technical Lead**

I was the technical lead for the Applied Research Centre, leading DSTL in a multi-organisation collaboration including the Home Office. I defined, prioritised, reviewed and had oversight of the deliverables from a team of academics and partner universities. This was a complex challenge in managing different interests, priorities and goals. I identified and prioritised objectives in order to better utilise ARC researchers for our requirements.

**Project Lead**

Working closely with our partners at the US Air Force Research Laboratory, we developed an innovative system that addresses the need for a uniform platform for sharing and disseminating applications in Autonomous Systems and Artificial Intelligence. I identified the need and jointly proposed a novel solution which was a success in demonstrating the collaborative benefits of working with our international partners in addressing joint defence needs.

# Education

2024 [Enrolled]	MBA Master of Business Administration	University of York
2023	PhD Artificial Intelligence & Biomedical Engineering	King's College London

## AI-Enhanced Risk Stratification for Implanted Defibrillators in Ischemic Cardiomyopathy Patients

Susceptibility to cardiac arrhythmias represents a highly complex system with intrinsic dependence on pathological structural and functional cardiac properties. Current guidelines suggest the use of a compromised LV ejection fraction (LVEF) to guide ICD implantation; however, only a third of SCD cases exhibit low LVEF. Functional biomarkers (from ECG recordings) and structural biomarkers (from MR imaging) have been independently correlated with arrhythmia risk, however, they have yet to demonstrate sufficient power to alter current clinical practice.

Therefore, my hypothesis is that an artificial intelligence enhanced risk prediction model which combines both structural and functional features, augmented by structure-function simulation-based features, will significantly improve risk stratification for ICD requirement.

2014	PGCE Mathematics	St Mary's University
2013	MSc Applied Statistics with Operational Research	Birkbeck College
2011	BSc (Hons) Applied Mathematics	University of Nottingham

# Publications

**JACC CVI** Jones, R. E., Zaidi, H. A., Hammersley, D. J., Hatipoglu, S., Owen, R., Balaban, G., ... & Prasad, S. K. (2023). Comprehensive Phenotypic Characterization of Late Gadolinium Enhancement Predicts Sudden Cardiac Death in Coronary Artery Disease. *JACC: Cardiovascular Imaging*.

**Frontiers in Cardiovascular Medicine** Zaidi, H. A., Jones, R. E., Hammersley, D. J., Hatipoglu, S., Balaban, G., Mach, L., ... & Bishop, M. J. (2023). Machine learning analysis of complex late gadolinium enhancement patterns to improve risk prediction of major arrhythmic events. *Frontiers in Cardiovascular Medicine*, 10, 1082778.

**EP Europace** Qian, S., Monaci, S., Mendonca-Costa, C., Campos, F., Gemmell, P., Zaidi, H. A., ... & Bishop, M. J. (2023). Additional coils mitigate elevated defibrillation threshold in right-sided implantable cardioverter defibrillator generator placement: a simulation study. *Europace*, 25(6), euad146.

**Defence Science and Technology Laboratory** Crumbs! Understanding Data: a Dstl biscuit book. <https://www.gov.uk/government/publications/crumbs-understanding-data-a-dstl-biscuit-book/crumbs-understanding-data-a-dstl-biscuit-book>

**BMC Public Health** Zaidi, H., Bader-El-Den, M., & McNicholas, J. (2019). Using the National Early Warning Score (NEWS/NEWS 2) in different Intensive Care Units (ICUs) to predict the discharge location of patients. *BMC Public Health*, 19, 1-9.

# Conference Proceedings

**European Heart Journal** Jones, R. E., Zaidi, H. A., Hammersley, D. J., Halliday, B. P., Hatipoglu, S., Owen, R., ... & Prasad, S. K. (2021). In-depth phenotypic characterisation of myocardial fibrosis by cardiovascular magnetic resonance predicts sudden cardiac death in coronary heart disease: a long-term prospective outcome study. *European Heart Journal*, 42(Supplement<sub>1</sub>), ehab724-0625.5

**BMJ** Hammersley, D. J., Zaidi, H. A., Jones, R. E., Hatipoglu, S., Androulakis, E., Mach, L., ... & Prasad, S. K. (2023). 13 Myocardial fibrosis entropy is associated with life-threatening arrhythmia in non-ischaemic cardiomyopathy.

**Heart Rhythm** Qian, S., Monaci, S., Mendonca-Costa, C., Campos, F., Gemmell, P., Zaidi, S., ... & Bishop, M. (2022). In-silico optimisation of ICD defibrillation efficacy by modifying lead/can configurations using a cohort of high-resolution whole-torso heart models. *Europace*, 24(Supplement<sub>1</sub>), euac053-449.

**EP Europace** Zaidi, H., Jones, R., Hammersley, D., Hatipoglu, S., Balaban, G., Mach, L., ... & Lamata, P. (2023). Left ventricular shape remodelling predicts major arrhythmic events in stable coronary artery disease. *Europace*, 25(Supplement<sub>1</sub>), euad122-289.

**Heart Rhythm** Zaidi, H., Jones, R., Hammersley, D., Hatipoglu, S., Balaban, G., Mach, L., ... & Prasad, S. K. (2022). PO-683-07 Cardiovascular magnetic resonance myocardial scar pattern predicts major cardiovascular events in CAD. *Heart Rhythm*, 19(5), S371.

**EP Europace** Zaidi, H., Hammersley, D., Jones, R., Hatipoglu, S., Androulakis, E., Balaban, G., ... & Prasad, S. (2023). Advanced 3D analysis of fibrotic ring-like pattern in non-ischemic cardiomyopathy predicts major arrhythmic events. *Europace*, 25(Supplement<sub>1</sub>), euad122-294.

**EP Europace** Zaidi, M. H., Hammersley, D. D., Jones, D. R., Hatipoglu, D. S., Androulakis, D. E., Balaban, D. G., ... & Bishop, D. M. (2023). Fibrosis entropy is associated with life-threatening arrhythmia in non-ischaemic cardiomyopathy. *Europace*, 25(Suppl 1).

**European Heart Journal** Bhagirath, P., Campos, F. O., Zaidi, S. H., Chen, Z., Elliott, M., Gould, J., ... & Bishop, M. J. (2023). 3D substrate complexity analysis using cardiac MRI predicts ICD therapy in post-infarct ventricular tachycardia. *European Heart Journal-Cardiovascular Imaging*, 24(Supplement<sub>1</sub>), jead119-328.