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Hiring Manager
School of Mathematics & Statistics
University of Glasgow
Glasgow, United Kingdom
and
Quanta Dialysis Technologies Limited
Warwick, United Kingdom

Dear Hiring Manager,

**RE: KTP Associate - Mathematical Modelling & Computation for Innovative Dialysis Technology
(Ref No: 181113)**

I am writing to express my strong interest in the KTP Associate position focused on mathematical modelling and computation for innovative dialysis technology. Having recently submitted my PhD thesis in Computational Science and Mathematical Modelling at Coventry University with my viva scheduled for October 2025, I am excited about this unique opportunity to bridge academia and industry in addressing critical healthcare challenges. My academic journey began with a BEng in Electrical and Electronics Engineering from Kwara State University, followed by an MSc in Data Science and Computational Intelligence from Coventry University, where I achieved a Distinction. This progressive educational foundation, combined with my commitment to continuous learning, has equipped me with a robust technical skill set that spans engineering principles, data science methodologies, and advanced computational techniques. I am particularly drawn to this role as I am currently based in Coventry, making the Warwick location ideal for me, and the prospect of contributing to life-saving dialysis technology deeply aligns with my passion for applying computational methods to real-world health challenges.

My doctoral research has equipped me with directly relevant expertise in fluid dynamics and computational modelling. I co-authored a recent publication in *Physics of Fluids* (2025) on "Fluid-structure interaction analysis of pulsatile flow in arterial aneurysms with physics-informed neural networks and computational fluid dynamics." and other research in the field of computational fluid dynamics. Additionally, I assisted other researchers in developing physics-informed neural network models for predicting wall shear stress in arterial aneurysms. This experience in biological fluid systems directly translates to optimising flow patterns in dialysis technology. My proficiency in developing physics-informed models that combine theoretical rigour with computational efficiency would be invaluable for Quanta's innovative approach.

Through my PhD work on forecasting critical care demand during COVID-19, I developed hybrid physics-informed neural network models that integrate domain knowledge with data-driven approaches, with this research published in a peer-reviewed book chapter. This methodology is particularly relevant to pioneering novel flow modalities in dialysis, where understanding the underlying physics of fluid transport and filtration is crucial for treatment efficacy.

I bring proven experience in bridging academia and industry, having worked as a Business Systems Analyst at Verificar Compliance, where I successfully translated complex technical solutions into practical

business implementations. This experience, combined with my current role as Lecturer in Computing at QAHE Ltd, has honed my ability to communicate technical concepts to diverse stakeholders and lead collaborative projects effectively. My technical expertise covers the full spectrum required for this role, including proficiency in Python, R, and Julia for mathematical modelling and simulations, as well as optimisation algorithms. I have substantial experience in computational fluid dynamics and numerical methods for engineering problems, and I am skilled in machine learning frameworks for model optimization. My commitment to continuous learning is evident through my pursuit of additional certifications, including edX courses in Optimization Principles and Algorithms, and various professional development programs in machine learning and data science. This dedication to staying current with emerging technologies and methodologies ensures I can adapt quickly to new challenges and contribute innovative solutions. My publication record demonstrates my ability to deliver high-quality research outputs, while my teaching experience ensures I can effectively mentor team members and disseminate findings to both technical and non-technical audiences. My collaborative approach will ensure effective knowledge transfer between the University of Glasgow and Quanta Dialysis Technologies.

The challenge of optimising dialyser performance through novel flow modalities particularly excites me, as it builds upon my previous work in infectious disease dynamics and fluid mechanics. Being based in Coventry, I can fully commit to on-site work at Quanta's Warwick facility while maintaining strong connections with the Glasgow academic team. This proximity enables immediate engagement with both experimental and software teams, facilitating the rapid iteration cycles essential for medical device innovation. I am eager to contribute to this impactful project and excited about the opportunity to shape the future of dialysis technology while advancing my career in applied research.

Thank you for considering my application. I would welcome the opportunity to discuss how my research experience and technical skills can contribute to advancing Quanta's innovative dialysis technology. I am available for interview at your earliest convenience and can be reached at ajaoolarinoyemichael@gmail.com or +44(0)7955797785.

Yours sincerely,

Michael Ajao-Olarinoye