**Job Description**

**Job Title:                                            Modelling and Simulation Research Engineer – Computational Engineering Physicist**

**Career Level:                                     3**

**Department or Business Sector:**    **Modelling and Simulation Department, Digital Engineering**

**Location**:                                            Coventry/Liverpool, UK

**Reporting to (manager’s job role): Designated Resource Manager**

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| **Heading:** | **Description** |
| **1.     Job Purpose & Impact** | The Senior Research Engineer (SRE) role is primarily focused on the independent technical delivery of projects and leadership in the development of project related activities across The MTC, working across various technology departments and industrial sectors. To lead project technical deliverables, taking ownership to ensure work meets or exceeds agreed customer requirements, and is delivered within agreed budgets and timescales. Where delegated, to act as Technical Governance lead for project deliverables. Undertake innovative Engineering research work focused primarily on technology/manufacturing readiness levels (TRL/MRL) 3+, and able to demonstrate industrial project delivery. You will support Senior Managers with a proactive approach in the identification, technical specification, and delivery of new and novel technology capability into the MTC, customers, or industrial members premises. You will require involvement in all aspects of the project delivery, taking overall ownership and ensuring compliance with all relevant standards, technical support of commissioning, management of project budget and deliverables. This is a Senior Research Engineer role based in the Modelling and Simulation department within Digital Engineering, delivering work primarily in the area of Physics Modelling. You will provide solution concepts, develop, integrate and implement Physics-based models, understand the underlying Physics and Engineering principals and theories and optimise manufacturing processes and designs of products through modelling and simulation methods. Provide a level of technical expertise and support to GREs, REs & AREs during project delivery. Contribute to the development and maintenance of Physics Modelling value propositions, roadmaps and technology horizon scanning activities and ensure that Industrial Sectors have the appropriate understanding of and supporting marketing material for products and services relating to the Physics Modelling offerings. Own their career development through mentoring, coaching and training courses, and is expected to have a personal development plan. Assist the Resource Manager in mentoring and upskilling of junior engineers. |
| **2.     Communication** | Must be able to communicate to all levels of the business in a professional and courteous manner, to support all parts of the business to run as one MTC to deliver corporate objectives.  Able to demonstrate the use of coaching and mentoring to support colleagues and transfer knowledge in area of expertise to others, within own department and wider MTC colleagues, proactive in Support training and development of team members.You will lead customer and internal partner liaison in collaborative projects to ensure overall project delivery and direction, able to lead technical liaison with customers during project delivery. Demonstrable commercial awareness and liaise with Product Development Managers to identify business development opportunities. Maintain and own relationships with Industrial Sectors and internal stakeholders. Lead project proposal and business case writing for the Physics Modelling team portfolio, from a range of funding sources including industrial, collaborative R&D and internal. Maintain regular communication with the Resource Manager on the status of the project pipeline and forecasting future resource loading and skills. Create channels of communications with the Technology Manager on market trends and state-of-the-art technology that has relevance to MTC members and customers. Co-ordinate research efforts between Physics Modelling and other themes. Maintain and own relationships with Industrial Sectors and internal stakeholders. Show ownership of Health and Safety to ensure own and your colleague’s health (both physical & mental), pro-actively reporting any concerns, near-misses or accidents. Able to demonstrate an excellent standard of verbal and written communication skills,   |
| **3.     Innovation** | Generation of key project and strategic initiatives in alignment with theme's strategy, actively supporting to develop the theme business and technology strategy in a specific area of expertise;  Application of experience and analytical approach to complex multi-faceted technical problems. An excellent grounding in physical and engineering principals in their chosen field with a preference on modern manufacturing processes; Application of logical reasoning to subroutine and application development; coupled with ability to articulate logic principals clearly and concisely; You will take the lead and ownership in proposal of new capability development projects that align with the Department, Technology Theme, and overall MTC strategy, and able to explore different routes for project funding (internal, industrial, or CR&D funding);Involved with horizon scanning of technologies and new approaches to solving industrial problems across a range of industrial sectors; Able to lead engagement with existing customers to win repeat business. Able to identify and support continuous improvement in technical aspects of the MTC’s project delivery capability including: behaviours; processes; structures; methods; techniques; and, tools |
| **4.     Knowledge** | Degree calibre engineer, technologist, scientist or mathematician. Ideally working towards professional registration, Chartered professional qualification is desirable; Have a strong commercial awareness and business acumen applied to a sector relevant to the MTC; The candidate must have strong logical reasoning and analytical skills; A relevant degree in Physics, Engineering, Mathematics, Data, Computational or Materials Science is preferable. Extensive demonstrable background working with simulation applications across multiple manufacturing areas.  Knowledge of the manufacturing sector and understanding of manufacturing systems and technologies;  Expert knowledge in using one or more of the following:       Finite Element Analysis (FEA);       Computational Fluid Dynamics (CFD);       Discrete Element Method (DEM);       Design of Experiments & Statistical Analysis. Expert knowledge in simulating any of MTC’s manufacturing processes and / or in verification and validation of product or machine designs; Have subject matter expertise in one or more of the core areas of the team: electromagnetics, fluid dynamics, particle motion, structural mechanics, heat transfer, acoustics and optimisation methods; Have subject matter excellence in one or more of the core areas of manufacturing application within the business: laser processing and surface engineering, material joining, additive manufacturing, net-shape technologies, bending, forging and forming, machining, etc.; Have knowledge in one or more coding languages (e.g. python, Java, C++), preferably in the development of subroutines of applications; Have knowledge/ awareness of model and systems integration and interoperability, and simulation data management. Secondary: Have knowledge/ awareness of model management software or techniques. Have knowledge/ awareness of Manufacturing Enterprise Systems (MES) and their application to manufacturing environment; Have knowledge in areas of sustainability or circular economy; Application of modelling best practice and VVUQ frameworks; Capable of project Management. |
| **5.     Person Specification** | All aspects of the role are to be carried out as an exemplar within the business in adhering to the MTC RIGHT way:        Acting responsibly, putting MTC’s interests ahead of personal ambition;       Providing inspirational leadership to all who come in contact with you;       Delivering in the broadest sense a great working environment;       Leading with humility, honesty and integrity in all that you do;       Promoting teamwork, supporting through difficult times and collectively celebrating our successes.In addition:Demonstrable substantial and recognised expertise in a specific area relevant to the theme. Expert knowledge of the manufacturing sector and deep understanding of manufacturing systems and technologies; Committed to work collaboratively and network effectively, able to recognise the contribution of others and team-work with a one MTC mind-set;Pragmatic hands on experience, providing problem solving approach and who is willing to physically participate in completion of work when required. Self-motivated and a self-starter, with the ability to work autonomously to meet deadlines, budgets and quality expectations, both within a team, or independently.  Experience working where subsequent adherence to associated process and policy is critical to maintain customer confidentiality.In addition:Whilst not obligatory, there is a preference that you are willing and able to apply for Developed Vetting security clearance by the UK Government and undertake duties associated with this level of clearance; Behaviours – MTC holds a high standard of professional behaviour and conduct of all colleagues; the environment across The MTC is one of collaboration. Colleagues are supported by leaders across the business to be empowered to challenge all colleagues in the MTC Right Way that is respectful and constructive. |