University of Nottingham
UK | CHINA | MALAYSIA

# Role profile

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| Job title | Research Associate/Fellow in AI based design for 3D printing | Job family and level | Research Level 4 (Appointment will be Level 4 Career training grade where an appointment is made before PhD has been completed) |
| School/ Department | Engineering - Centre for Additive Manufacturing | Location | Jubilee Campus, Advanced Manufacturing Building |

## Purpose of role

This role will be part of a team working on a new EPSRC funded Programme Grant “Dialling Up Performance for On Demand Manufacturing” (grant reference: EP/W017032/1), led by Prof Ricky Wildman. The role will support the Investigator team in developing AI generative design methods for 3D printing, whilst also achieving the Programme Grant’s overall research objectives of improving adoption of 3D printing in biotech and healthcare industries.

The role holder will develop and use generative design and related AI methods to support the design and optimisation of complex, multimaterial, multifunctional products manufactured via additive manufacturing / 3D printing. The post will sit within a multidisciplinary team that aims to create a toolkit and workflow for the rapid identification of materials, formulations and designs, using advanced products to drive development and generate data. The products are all focused on exploiting the design freedoms of additive manufacturing, using micro stereolithography, ink jet printing and other photocurable methods to advance the manufacture or delivery of new therapies. Identified products include oral delivery of biologics, regenerative medicine or cell-based therapies and biocatalysis based reactors.

As part of the multidisciplinary, multi-centre Programme (consisting of a team > 10 researchers) you will work under the direction of Prof. Ricky Wildman, Prof. Ian Ashcroft and Dr. Yinfeng He (Faculty of Engineering). The role holder is expected to have strong self-motivation and creativity and will also have responsibility for writing up their work in order to contribute to and / or lead the publishing of outcomes.

What we offer is an inspiring and innovative research environment, with mentorship and guidance from world-renowned experts in Additive Manufacturing and opportunities for professional growth and development.

The researcher is expected to hold the values of the University of Nottingham: they will contribute to a positive research culture, commit to an ethos of collaboration and be willing to support the development of others, including undergraduates, postgraduates and other researchers.

| | Main responsibilities<br>(Primary accountabilities and responsibilities expected to fulfil the role) | **% time per year** |
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| 1 | To plan and conduct research using established approaches, methodologies and techniques within the research area and support the development of improved methodologies to enhance the projects goals | 30 |

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| 2 | To analyse and illuminate data, interpret reports, evaluate and criticise texts and bring new insights to research area. | 35 |
| 3 | To contribute to writing up research findings for publication. | 7 |
| 4 | To assist with the preparations, proposals and applications to both external and/or internal bodies for funding, contractual or accreditation purposes. | 7 |
| 5 | To build internal and/or external contacts to develop knowledge and understanding, forming relationships for future collaborations. | 3 |
| 6 | To assist in the operational aspect of research networks, for example, supporting research meetings and updating databases etc and contribute to collaborative decision making with colleagues in area of research. | 3 |
| 7 | To provide guidance as required to support staff and students, where appropriate in own area of expertise. | 5 |
| 9 | To plan and manage own research activity and resolve problems, if required, in meeting own/team research objectives and deadlines in collaboration with others. | 10 |

## Person specification

| | Essential | Desirable |
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| **Skills** | ▪ Excellent oral and written communication skills, including the ability to communicate with clarity on complex information.<br>▪ Demonstrable skills in the use and development of AI and / or generative design tools<br>▪ Ability to use and develop code based on scientific programming languages, such as Python<br>▪ Analytical ability to facilitate conceptual thinking, innovation and creativity.<br>▪ Effective laboratory note-taking and logging of experiments and data.<br>▪ Ability for independent research within the context of a team.<br>▪ Ability to prioritise and organise resource requirements and deploy effectively.<br>▪ Strong analytical ability to analyse and illuminate data, interpret reports, evaluate and criticise texts and bring new insights. | ▪ Ability to foster a research culture and commitment to learn in others.<br>▪ Experience with machine learning/deep learning models for solving research problems.<br>▪ Familiar with software for data analysis, systems control or design<br>▪ Demonstrable skills in using photocurable based additive manufacturing systems, such as stereolithography |
| **Knowledge and experience** | ▪ Experience of successful working in a multidisciplinary team.<br>▪ Demonstrated creativity and leadership in problem solving.<br>▪ Understanding of additive manufacturing methods such as vat polymerisation and ink jet printing | ▪ Knowledge of fluid/dissolution mechanisms<br>▪ Knowledge of the characterisation techniques such as UV-vis, surface profiling.<br>▪ Experience of working with and analysing large datasets<br>▪ Liaising with external partners. |
| **Qualifications, certification and training (relevant to role)** | ▪ PhD (or about to obtain) in Engineering or Physical Sciences with a substantial computational methods component | ▪ Training in health and safety/risk assessment. |

Athena SWAN Silver Award

As part of this, we welcome a diverse population to join our work force and therefore encourage applicants from all communities, particularly those whose protected characteristics under the Equality Act 2010, are not well-presented in our current staff body.

Signatory of DORA

The University is a signatory of the Declaration on Research Assessment (DORA). As such we commit to focus on the scientific content of publications (where requested or provided as part of the recruitment and selection process) as a basis for review of quality, and consideration of value and impact of research conducted, rather than any proxy measures such as Journal Impact Factor.

## Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

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| **Valuing people** | Is friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported. |
| **Taking ownership** | Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations. |
| **Forward thinking** | Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process. |
| **Professional pride** | Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices. |
| **Always inclusive** | Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area. |

## Key relationships with others