

THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF HUMANITIES

ALLIANCE MANCHESTER BUSINESS SCHOOL

DIVISION OF MANAGEMENT SCIENCES AND MARKETING (MSM)

**MACHINE LEARNING AND MATHEMATICAL OPTIMISATION RESEARCHER (KTP
ASSOCIATE)**

VACANCY REF: HUM-13217

Salary:	Grade 6 £32,236 to £39,609 per annum (according to relevant experience) plus £5000 personal development budget
Hours:	Full Time
Duration:	Immediately for 30 Months from agreed start date
Location:	365 Response Ltd, Wakefield

Enquiries about the vacancy, shortlisting and interviews:

Contact: Dr Manuel Lopez-Ibanez

Email: manuel.lopez-ibanez@manchester.ac.uk

BACKGROUND

Overview of 365 Response Ltd.

Information about 365 Response Ltd can be found on their website at www.365response.org

Overall Purpose of the Job:

Design, develop and test new tools to improve transport flow and resource utilisation across health and care to improve quality of care for service users and efficiency for providers. These tools will be integrated in an Artificial Intelligence (AI) engine that combines state-of-the-art modelling, optimisation and machine learning techniques, in order to augment human decision making and thus revolutionise the way services are forecast, resources planned and dispatched, and real-time events managed.

The project has the following stages:

- Training in 365Response existing tools for transport planning.
- Exploration of data sources relevant to the project.

- Improvement of existing algorithms for journey planning
- Development of a capacity planning tool that can ensure that the right number of vehicles, of the right type and capacity and the correct numbers of staff with the required training are available and on duty and able to fulfil the requirements for transport.
- Development of a live (dynamic) flow model based upon data from across the system with the functionality to support what-if modelling and integrate simulation-based-optimisation techniques.

After the completion of this project, there is a possibility of continued employment at 365Response in a full time permanent position.

What is a KTP?

Knowledge Transfer Partnerships (KTP) is Europe's leading programme helping businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills that reside within the UK knowledge base. Throughout the KTP you will;

- Receive a competitive salary
- Gain excellent experience of managing a high profile project
- Receive formal management training
- Have access to a £5,000 professional development and training budget
- Receive mentoring and support from academic staff and industry professionals

Further information on KTP, including case studies, can be found at;

<http://www.manchester.ac.uk/collaborate/business-engagement/knowledge-exchange/transfer-partnerships/>

Key Responsibilities, Accountabilities or Duties:

The range of duties will include:

- Formulate machine learning and optimization models for a given problem, and translate the conceptual models into appropriate code
- Undertake research (data collection, analysis, preparing, setting up, conducting and recording the outcome of simulations and computer experiments). Conduct literature and database searches.
- Write up results of own research
- Contribute to the production of research reports and publications.
- Contribute to the planning of research projects.
- Present information on research progress and outcomes to bodies supervising research.
- Liaise with research colleagues and support staff on routine matters.
- Provide guidance as required to support 365Response staff and any students who may be assisting with the research.
- Actively participate as a member of a project team.
- Attend and contribute to relevant meetings.
- Make use of standard research techniques and methods.
- Identify and proactively deal with problems that may affect the achievement of research objectives and deadlines.
- Contribute to decisions affecting the work of the team.

- Analyse and interpret the results of own research and generate original ideas based on outcomes.
- Plan own day-to-day research activity within the framework of the agreed programme.
- Co-ordinate own work with that of others to avoid conflict or duplication of effort.
- Continue to update knowledge and develop skills.

PERSON SPECIFICATION

Essential Knowledge, Skills and Experience:

- PhD degree or equivalent in a relevant subject (e.g., Computer Science, Physics, Engineering, Applied Mathematics, Business Analytics, Operations Research, Business Engineering, Data Science, Data Analytics, Artificial Intelligence, etc.) *The partnerships preference is appointment at PhD level however; we do encourage applications from individuals with a Masters in Computer Science, Applied Statistics, AI or Machine Learning with relevant industrial experience.*

Essential Skills & Attributes:

- Specialist knowledge in the discipline of machine learning techniques and tools and/or mathematical optimisation.
- Experience in research methods and techniques related to clustering, classification and regression methods, including data pre-processing, analysis and visualisation
- Excellent software development skills and experience.
 1. Agile development techniques;
 2. Database development and integration
 3. Ability to convert scientific data solutions into functioning algorithms capable of being embedded in commercial applications.
 4. Object-orientated programming principles with in depth knowledge of at least one programming language, C# preferred.
- Excellent communication and interpersonal skills
- Excellent time management and organisational skills
- Ability to work independently and as part of a team
- Ability to liaise confidently and effectively with a range of individuals
- Flexible approach to dealing with research problems as they arise
- Willingness to learn and develop new knowledge and skills
- Ability to present in both written and oral publications
- Ability to meet deadlines
- The ability to evaluate complex data
- Ability to consider and integrate complementary or conflicting view points

Desirable Knowledge, Skills, Experience and Qualifications:

- Experience in transportation and/or routing problems arising in the healthcare industry.
- Knowledge of business processes and workflow design, integration and implementation of enterprise software.
- A commercial aptitude and ability to understand the needs of internal and external customers.