KTP Associate Role Profile

Job Title:	Intelligent Routing & Analytics Associate (KTP Associate, Whitespace Work Software)

Business Partner / University School	**Whitespace Work Software Ltd** and the **University of Surrey's** Surrey Business School and the School of Engineering .

Based at:	Whitespace Work Software Limited, Riverside Court, Douglas Drive, Godalming, Surrey, GU7 1JX

Job Summary and Purpose:

The University of Surrey in partnership with **Whitespace Work Software Ltd,** seeks a highly motivated recent postgraduate to co-lead an exciting and transformative Knowledge Transfer Partnership (KTP) project. This is a rare opportunity to drive innovation at the intersection of academia and industry, working on a pre-defined programme of works with real-world impact.

About KTP:

The KTP program is not your typical (post)graduate scheme - it is a launchpad for ambitious individuals ready to fast-track their career in a dynamic business environment. As a KTP Associate you'll transition seamlessly from academic study into industry, applying your expertise to solve meaningful challenges and deliver innovation from day one.

A KTP Project is a powerful three-way collaboration between:

- (You) the Associate – leading innovation and change,
- The Business Partner (a company), where you will be based, and
- The Knowledge Base (a university), providing academic insight and support.

The benefits:

- Hands-on experience in a forward-thinking company,
- A dedicated professional development budget,
- Tailored Business and Leadership training,
- Mentorship from both academic and industry experts, and
- The chance to build high-impacts skills in project management, strategic thinking, and innovation delivery.

Co-funded by Innovate UK and the Business Partner, this **24-month** fixed-term role offer the potential to progress to a permanent position with the Business Partner with the business partner upon successful completion of the KTP.

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The Associate is employed by the University of Surrey but embedded with the Business, working under the guidance of experienced company professionals and supported by leading university academics.

About Whitespace:
As the UK's market leader in environmental and waste software, Whitespace empowers over 100 local authorities and public sector contractors with smart, scalable solutions. Since 2005, they have built a reputation for delivering reliable, future-ready technology that transforms waste management, environmental services, and contract operations. Our continued investment in products and people reflects our commitment to quality, innovation, and long-term partnerships.

If you are passionate about applying your academic knowledge to real-world challenges, and eager to make a lasting impact in a fast-paced, collaborative environment—this KTP opportunity is your gateway to a rewarding and future-focused career.

Main Responsibilities/Activities

This project aims to develop an AI powered, EV-Optimised route optimisation tool that assists Local Authorities in managing waste collection more efficiently and supports a transition to electric vehicles. This in-house solution will allow the business to maintain control over its costs, its development, and ensure its software meets the evolving client needs. In doing so, the Whitespace will be able to:

i) Swiftly process and analyse large volumes of data, enabling it to rapidly make informed decisions, and
ii) Establish a robust framework for continuous software development and maintenance, ensuring its effectiveness and adaptability to evolving needs.

The project, given its specialised operational research core, demands substantial input from the Surrey Business School due to the route planning's business relevance. Static and dynamic optimisations are the primary focus point. Algorithms and solutions are devised that offer strategic, long-term routes, as well as the capability for real-time routing decisions. Sophisticated machine learning models will be integrated to enhance traditional optimisation techniques. These models will be used to forecast key stochastic parameters, such as traffic patterns, weather conditions, and waste generation variability, which are crucial for making dynamic routing decisions. By combining predictive analytics with robust optimisation frameworks, the project seeks to deliver intelligent, resilient, and data-driven solutions for urban environmental service management. The profile for the Associate requires a postgraduate degree in Operational Research, Applied Mathematics, Data Science, Computer Science or Business Analytics, encompassing algorithm design, machine learning/AI, and data analytics. An interest in route optimisation and experience in applying optimisation techniques and solving complex combinatorial problems would be extremely beneficial.

The Associates will play a key role in enabling effective knowledge exchange and integration between the business partner and the University of Surrey academics. To ensure the success of interdependent projects, the Associates must cultivate a dynamic, cohesive, and strategically aligned working relationship. Working collaboratively, the **two Associates** will drive KTP impact through cross-business engagement; align methodologies, terminology, and assumptions; define shared

performance goals and metrics; coordinate real-time integration of static and dynamic components during testing; and visually articulate complex solutions to a range of stakeholders.

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Person Specification

The post holder profile:

- Holds a postgraduate degree in Operational Research, Applied Mathematics, Computer Science, Business Analytics, or a closely related quantitative field.
- Demonstrates experience in optimisation algorithm development, machine learning/AI, natural language processing, and Data Analytics.
- Possesses a strong grasp of routing algorithms (e.g., Dijkstra, A*) and graph theory.
- Preferably knowledgeable in the Arc Routing Problem, Vehicle Routing Problem, Rural Postman Problem, Travelling Salesman Problem, etc.
- Preferably, has a background in data-driven research and high-performance computing environments.
- Proficient in business intelligence and data visualisation tools (e.g. Power BI), SQL, and cloud-based database systems.
- Preferably, an understanding of Geographic Information Systems (Ordnance Survey, QGIS, postGIS in PostgreSQL).
- Skilled in programming languages such as Python, Matlab, R, C# (Focused on Routing Algorithms).
- Preferably, experience in Vibe coding (GenAI use of Claude, ChatGPT, Copilot, etc.).
- High competency written and spoken English at a technical level (e.g. IELTS 7.0 or a degree qualification from a majority English-speaking country).
- Enthusiasm about applying scientific methods to address industry needs.
- Project management/Business Acumen: Ability to lead a strategic project, mapping business and information processes, presenting insights in clear reports, and translating technical jargon for non-technical audiences.
- Excellent communication skills to effectively engage with diverse stakeholders from various backgrounds, including technical, business, policy, scientific fields.
- Strong team players with a commitment to continuous soft skills development.

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Relationships and Contacts

This is not an exhaustive list of every relationship the post holder has but is a brief description of those that play an important part in the post holder successfully carrying out the role.

As an integral member of the University of Surrey's KTP team, the Associate will collaborate closely with both university academics and the business partner Supervisors. This will involve building a project team and maintaining regular communication with the University's KTP Office. Weekly meetings (both online and on-site at the Business Partner's location) will ensure ongoing engagement with the academic team. This role is one of two KTP Associate roles at Whitespace - the two Associates must establish an optimal, proactive, and integrated working relationship.

The role offers valuable networking opportunities with other KTP Associates. Additionally, the Associate will have the chance to interact closely with professionals from the business partner and their clients who may provide valuable feedback on the project's direction and progress.

Internal Relationships

- University KTP Office
- Business Partner KTP delivery team
- Academic KTP delivery team
- 2nd KTP Associate
- Other University of Surrey Staff and Students
- Other Company Staff

External Relationships

- Innovate UK Business Connect - KT Adviser.
- Other KTP Associates.
- BETA focus group
- Business Partner's Clients.

Special Requirements

Based at the Business Partner site, the KTP Associate:

- Must be prepared to work outside normal working hours, when required.
- Must be willing to undertake further studies, as approximately **10%** of their working hours should be **dedicated to training and development**.
- Will be required to travel to the University of Surrey, and occasionally more widely.

As a university employee, all KTP Associates are expected to:

- Undertake such other duties within the scope of the KTP as may be requested by their supervisors or Line Manager.
- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Follow the Business Partner's policies and working practices at all times to ensure that no disclosure of confidential information results from their actions.

- Follow University/School/Department policies and working practices at all times to ensure that no disclosure of confidential information results from their actions.
- Ensure they are aware of and abide by all relevant University / Business Partner / KTP regulations and policies relevant to their role.
- Help maintain a safe working environment by:

  - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand

- Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Be a team-player, supportive of colleagues and always operating in a collegiate manner.

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Addendum

This document provides additional information relating to both specific aspects of the post/faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Role Profile.

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Background Information

The **working hours, annual leave,** and **holiday entitlement** are those of the Business Partner.

The **standard working hours** of Whitespace work Software Ltd are 37.5 hours per week including 60 minutes taken as a lunch break.

- The standard hours are 09:00-17:30.
- Flexibility, with core office hours 10:00-16:00.
- Working pattern – expected to be office-based Monday to Thursday.

Annual Leave

The annual leave entitlement is 25 days per annum, plus UK public holidays.

- Office Closure – the office is closed between 24th December and 31st December. Circa 3 days holiday automatically taken from staff during this time.
- All annual leave should be approved and taken within the period of the KTP.
- The holiday year runs from 1st January to 31st December.

Potential to secure a permanent job with the business at the end of the KTP.

Please also see https://whitespacews.com/ and https://iuk-ktp.org.uk/

Benefits to expect from the University of Surrey include a generous pension, discounted membership to Surrey Sports Park, cycle-to-work scheme, season ticket loans. Access to a wide range of courses under the Learning & Development Programme; library access

Benefits to expect from the KTP Programme include opportunity to gain professional qualifications or a higher degree. Access to academic support and the University's facilities to help deliver the KTP project.

Person Specification

This section describes the sum total of knowledge, experience & competence required by the post holder that is necessary for standard acceptable performance in carrying out this role. This is in addition to the criteria contained within the accompanying generic Role Profile.

	Essential/ Desirable
Holds a postgraduate degree in Operational Research, Applied Mathematics, Computer Science, Business Analytics, or a closely related quantitative field.	E
Experience in optimisation algorithm design, machine learning/AI, natural language processing and Data Analytics.	E
Strong understanding of routing algorithms (e.g., Dijkstra, A*) and graph theory.	E

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Proficient in BI/Data Visualisation (Power BI) and SQL and cloud-based databases.	E
Background in data-driven research and High-performance computing.	E
Proficient in Coding (e.g., Python, Matlab, R, C#). (A1: data and modelling, A2: Routing Algorithms)	E
A high level of competence in spoken/written English at a technical level (i.e. IELTS 7.0 or a degree qualification studied in a majority native English-speaking country)	E
Enthusiasm about applying scientific methods to address industry needs.	E
Capable of translating complex technical concepts into layman language.	E
Methodical in experimentation with accurate and professional reporting.	E
Balance strategic issues while managing operational detail.	E
Proven ability to co-lead and manage a strategic KTP, integrating technical and strategic elements.	E
Strong team players with a commitment to continuous soft skills development.	E
An interest in the AI-driven optimisation and data analytics technologies would help with fitting into the business/project.	D
Strong interpersonal skills: ability to communicate and work with people at all levels.	D
Special Requirements	**Essential/ Desirable**
A clear understanding of the Business Partner where you will be based; and of the KTP program - how KTP works with business and the University, and the vital role the KTP Associate will play.	E
Ability to absorb knowledge and further develop skills during the KTP to complement those skills already in place.	E

Key Responsibilities

This document is not designed to be a list of all tasks undertaken but an outline record of any faculty/post specific responsibilities (5 to 8 maximum). This should be read in conjunction with those contained within the accompanying generic Role Profile.

1. Co-Lead the delivery of an innovative AI project in collaboration with a second Associate, bringing the academic expertise and commercial application.
2. Formulating/solving multi-objective optimisation problems as mathematical programs.
3. Collaborate closely with the second Associate to align data structures, input formats, and route interfaces.
4. Developing and validating machine learning and heuristic algorithms for dynamic routing under real-world constraints and data noise.
5. Ensuring interpretability and justification of AI-driven routing recommendations for end-users.
6. Translate complex data into actionable insights, using visualisation tools to present findings aligned with customer needs and priorities.
7. Embed new knowledge and capabilities within both the Business Partner and the University, ensuring long-term impact and knowledge transfer.

N.B. The above list is not exhaustive.