Job Title: AI Vision and Automation Engineer (KTP Associate)
Job Description & Specification

JOB DETAILS			
Department:	Engineering	**Salary Band:**	£37,000 to £43,300 per annum, with the starting point dependent on relevant qualifications and experience
Hours of Work	Full Time (37hrs)	**Contract Type:**	Fixed Term, 24 months
Responsible To:	Dr Marcelo Precoppe, Reader in Agricultural Engineering, Harper Adams University. Simon Oldcorn, Site Services Manager Newport, Karsten UK		
Work Location:	Karsten UK Limited, Suite 3, Nova House, Audley Avenue Enterprise Park, Newport, Shropshire, TF10 7DW		
Holiday Allowance:	23 days		

JOB PURPOSE

This post is funded through a Knowledge Transfer Partnership (KTP) between Harper Adams University and Karsten UK Limited, a fresh citrus processing and distribution business supplying major UK and European retailers. The Associate will develop and embed an AI-driven vision and quality sorting capability at Karsten UK's Newport facility. A Fanuc Delta pick-and-place robot, already owned by Karsten UK, provides the actuation platform. The system will inspect and grade fruit against retailer specifications, using a compact conveyor training rig. The KTP funds the vision and training components, not the robot.

A primary technical objective is to build a synthetic data pipeline using Discrete Element Method (DEM) simulation and photorealistic rendering, train AI camera models to 95% classification accuracy using synthetic data alone, and integrate the vision system with the robot controller so that classification outputs drive pick-and-place sorting. A reusable training method will allow the camera to be retrained for new products and specifications without manual image annotation or an external vision supplier.

Employment will be with Harper Adams University, with the Associate based full-time at Karsten UK's Newport facility and directed day to day by the site team. Academic supervision is provided for at least half a day per week, and the Associate will have access to the university's Collaborative Simulation Laboratory. Development, training, and validation will take place on the conveyor training rig beside production. The robot will reach live production

only after the vision system has been validated on the rig. The role requires a high degree of autonomy. It combines applied research with practical engineering delivery in a food processing environment.

MAIN ACTIVITIES & RESPONSIBILITIES

The Associate will develop a DEM simulation model representing fruit movement on the conveyor training rig. Calibration will cover contact parameters including friction coefficients, restitution properties, and rolling resistance, and the model will be validated against experimental measurements of fruit dynamics. The model will provide the physical basis for synthetic image generation.

A photorealistic rendering pipeline will integrate DEM simulation outputs with rendering software to generate synthetic images of fruit under production lighting conditions. The pipeline will define material properties for fruit skin, configure camera and lens parameters to match the vision system specification, and generate parametric scenario matrices covering conveyor speed, lighting, fruit orientation, and defect type.

Automated annotation extraction from simulation geometry and rendered images will be developed using scripting, so no manual labelling is needed. The Associate will design, train, and optimise AI classification models for multi-grade sorting. Validation will compare trained models against real fruit samples from Karsten UK production and establish ground truth comparisons with manual quality grading.

Integration with the Fanuc Delta robot and the conveyor training rig will require interfacing and control logic that translates classification outputs into pick-and-place commands. This includes configuring the camera and lighting, synchronising image capture with fruit presentation, implementing safety interlocks, and conducting commissioning and validation testing on the rig. The Associate will own and manage the robot on behalf of Karsten UK, as the actuation platform for the project.

Operational procedures, maintenance protocols, and training materials will be developed and delivered to production and maintenance personnel across multiple shifts. This will embed the capability within Karsten UK. Performance monitoring dashboards and continuous improvement protocols will sustain system performance. The Associate will quantify commercial benefits, including throughput improvement and value recovery from more accurate grading.

Technical reports, academic publications, and a project case study will be prepared in accordance with KTP programme requirements. Progress will be presented at regular Local Management Committee meetings with academic and industrial supervisors.

PERSON SPECIFICATION		
	Essential	**Desirable**
Qualifications	A first or upper second-class honours degree in Computer Science, Electronic Engineering, Mechanical Engineering, Mechatronics, Robotics, or a closely related discipline.	A postgraduate qualification (MSc or PhD) in a relevant engineering, computer science, robotics, or automation discipline. Evidence of continuing professional development in AI, computer vision, modelling, simulation, or industrial automation.
Experience	Demonstrable experience developing, training, or evaluating AI or machine learning models for image classification, object detection, or related computer vision applications. Proven programming or model-development experience using Python and/or MATLAB & Simulink, including data processing, model training, simulation, or automated workflows. Experience transferring models, datasets, or workflows between programming environments, or a demonstrated willingness to learn the alternative environment used by the project.	Experience with physics-based simulation tools such as DEM, FEA, CFD, or multibody dynamics software. Familiarity with photorealistic rendering software such as Blender or KeyShot for synthetic data generation. Knowledge of industrial control systems, PLC programming, or robot programming. Practical experience integrating vision or machine learning outputs with robotic, automation, or mechatronic hardware. A background in food processing, agricultural, or manufacturing environments. Prior industrial placement or collaborative research demonstrating delivery of practical outcomes.
Knowledge/Skills	Proficiency in at least one of Python or MATLAB & Simulink for developing AI or machine learning	Understanding of DEM simulation principles and calibration methodologies for

	applications, processing datasets, and implementing automated workflows, with a willingness to learn and use the other environment where the project requires it. Understanding of AI and machine learning principles, including convolutional neural networks, model training workflows, hyperparameter optimisation, and model validation. Familiarity with AI and computer vision development frameworks, libraries, or toolboxes in Python and/or MATLAB & Simulink. Understanding of computer vision principles, including image formation, lighting effects, camera calibration, and image acquisition. Ability to develop, test, validate, and document computational workflows using appropriate software tools. Ability to manage own workload, establish priorities, and meet deadlines with limited supervision.	granular or particulate materials. Familiarity with industrial imaging hardware, including cameras, lenses, and lighting systems for high-speed production environments. Knowledge of robot programming, PLC ladder logic, or industrial communication protocols. Familiarity with version control systems such as Git and collaborative software development workflows. Awareness of food safety regulations and quality standards relevant to fresh produce processing. Knowledge of co-simulation or hardware-in-the-loop testing approaches.
Personal Qualities	Strong verbal and written communication skills, with the ability to present technical information clearly to both engineering and non-engineering audiences. A collaborative team player who builds effective working relationships across organisational boundaries. Highly organised, with a methodical approach to planning	Demonstrated interest in applied engineering research and the translation of academic methods into industrial practice. Experience working across academic and industrial environments simultaneously.

	and executing complex technical work. Persistent and patient when confronting difficult technical problems, maintaining progress under uncertainty. Proactive and self-motivated, taking initiative to identify and resolve issues without waiting for direction. Adaptable and open to learning new tools, methods, and subject areas as project needs evolve. Sensitive to workforce concerns associated with automation, with the ability to engage production personnel constructively and build confidence in new systems.	

Application Procedure:
Applications will be assessed through two stages. In the first stage, candidates are asked to submit a full application, cover letter, and CV. The statement in the full application and the answers to the online application questions will be assessed as part of the shortlisting process. The statement must address technical skills, relevant experience, and personal qualities explicitly.

Shortlisted candidates will be invited to a formal interview held in person at Karsten UK Limited, Suite 3, Nova House, Audley Avenue Enterprise Park, Newport, Shropshire, TF10 7DW on Wednesday 16 December 2026. No remote interviews will be conducted. The interview will comprise three components. First, candidates will deliver a 7-minute presentation. The presentation will be assessed for systematic thinking, process understanding, communication clarity, and problem-solving approach. The topic will be provided to candidates in advance. Second, candidates will take part in a structured competency-based interview assessing technical knowledge, organisation, teamwork, and motivation. Third, candidates will have a separate informal conversation with a Karsten UK staff member, outside the main interview room. This conversation forms part of the selection process and will be used to assess communication skills, self-awareness, and the ability to identify and articulate practical requirements in an operational context. The target start date is Monday 25 January 2027, subject to the candidate's notice period and the completion of pre-employment checks.