

QUB-CSC Scholarship PhD Project Proposal 2018-2019

Title: Error propagation modelling and control in flexible manufacture	
Project Description:	
<p>Manufacturing systems would inevitably introduce errors due to stiffness and motion of the components in the system. These errors will be accumulated through the production chain, and influence the geometrical quality of the machined parts. Predicting part quality based on error propagation in the manufacturing processes represents a step change in managing production processes, as it removes the current cumbersome trial-and-error processes and enables rapid reconfiguration of production systems. This project is to create a new quality prediction capability for flexible manufacturing processes by revealing the relationship between manufacturing system errors and part or assembly quality. This leads to an effective error discrimination control strategy to achieve a better process control while ensuring the required product quality.</p>	
Key Skills Required for the post:	
<ul style="list-style-type: none"> • A bachelor degree in Engineering (Mechanical/Aerospace Engineering, Manufacturing, Mechatronics, or relevant) with an overall average at 83% or above; or a master degree with an overall average at least 80%. • Knowledge of error modelling and predication considered as advantage • Knowledge of robot kinematics, dynamics and control considered as advantage • Knowledge of CNC machining considered as advantage • Knowledge of cutting force modelling considered as advantage • Project management skills • Oral and written communication skills 	
Key Transferable Skills that will be developed during the PhD:	
<ul style="list-style-type: none"> – Innovative thinking in flexible manufacturing – Error modelling and control method – Method for cost benefit analysis – Experimental methods with flexible machines such as robots – Hands on skills on machines and metrology systems – Project and time management training to ensure milestones of the project are delivered. – Effective dissemination of research findings through presentation at international conferences and publication in high quality technical journals. <p style="padding-left: 20px;">Interpersonal skills within a multidisciplinary team including academics and industrialists</p>	
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