**PhD Project Proposal**

School of Electronics, Electrical Engineering and Computer Science

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| **Proposed Project Title:** Machine Learning in Intelligent Autonomous Devices |
| **Principal Supervisor:** Dr. J. McAllister |
| **Project Description:** Machine Learning (ML) and Artificial Intelligence (AI) techniques are developing both in their capabilities and the range of applications where they may be used. As they do, the techniques employed and the performance and power consumption constraints within which they must operate vary dramatically between, for instance, servers or autonomous vehicles. As a result, the computing architectures which enable AI in practise are becoming increasingly customised to specific techniques and deployment environments, mixing for example multicore processors, Field Programmable Gate Array (FPGA) or Graphics Processing Units (GPUs) to differing degrees. This project will address the design of custom ML applications and practical computing architectures for three kinds of applications: autonomous vehicles, robotics and computer vision.The specific objectives of the project are: * Develop an understanding of the behaviour, key operations and network structure of state-of-the-art neural networks for ML in the different application domains.
* Devise custom ML algorithms for the three application domains.
* Devise and realise strategies for tuning the computing architecture to the algorithm for each application.
* Create a demonstrator system showing the effectiveness of the resulting solutions.
* Present your work in leading international journals and conferences in the area.
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