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Towards Disaster Resilient DNN Inference Offloading Infrastructure (UN SDG No. 9)

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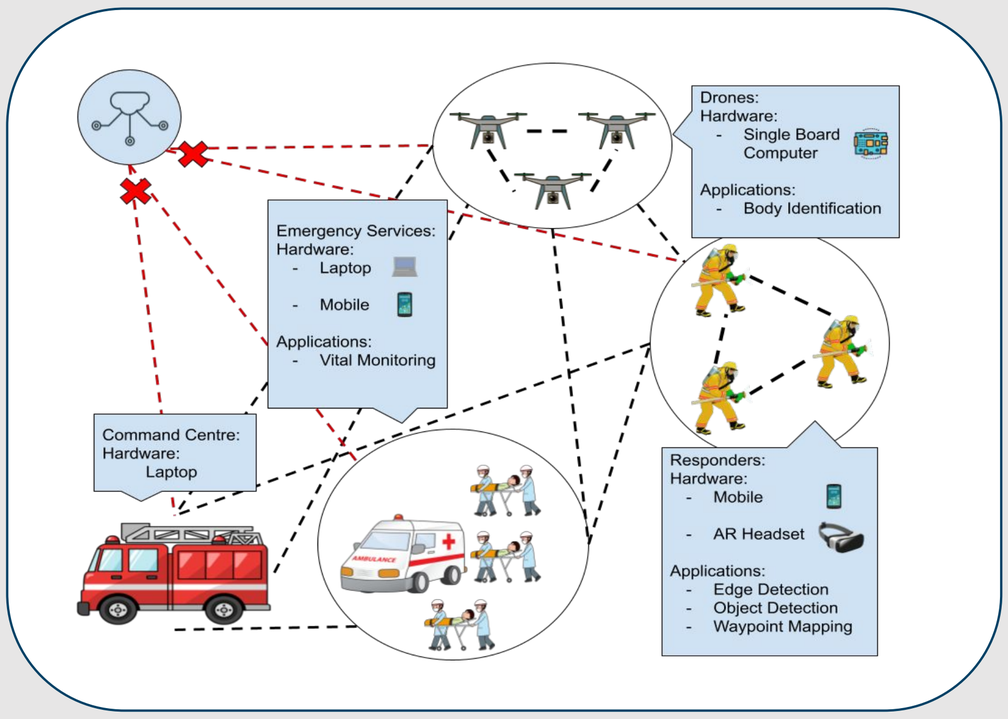
Project Goal

In times of disaster, damage to underlying telecom infrastructure can deny many complex "smart" applications (i.e. body identification drones, object detection) access to remote data centres that are used to alleviate the high computing costs of these tasks when performed locally.

To allow these applications to continue operating, we propose a mesh network of devices where each device can offload a portion of its workload to nearby peers. In such a scenario, each application can be considered critical. Thus we aim to explore a novel mechanism to enhance computational offloading that can adaptively adjust resources provisioned to each offloaded task when the network is under strain.



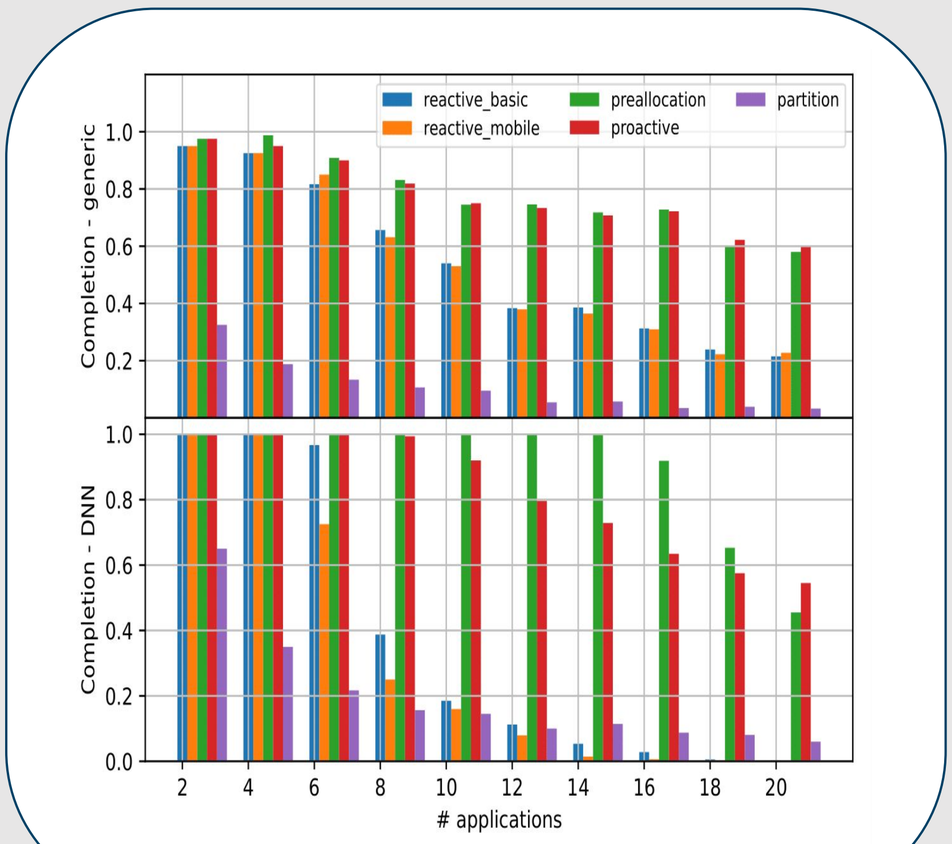
Current Progress - Exploring Different Offloading Methods

To implement such a system, we first need to understand the best approach to computational offloading in our desired scenario.

In our most recent work, we compare the efficiency of reactive, proactive and hybrid offloading algorithms when maximising the number of applications completed in a static network composed of a three-tier hierarchy (mobile device, edge servers and cloud).

We conducted experiments with each type of offloading algorithm where we offloaded N (1 -> 20) applications, conducting each experiment 20 times.

Based on our experiments, we have found that a fully proactive approach provides the most consistently high application completion rate in a static network.



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