

Mathematical modelling for operational decision-support in the Northern Ireland Ambulance Service

supervised by

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The Northern Ireland Ambulance Service (NIAS) is geographically the largest of six Health and Social Care Trusts in NI, serving a diverse region of 1.9 million people with 46 stations spread out over 5345 square-miles. NIAS services include both emergency and non-emergency response, including transport for those most vulnerable in society to hospital appointments.

NIAS is currently operating under the 'highest level of pressure ever' and the demand for the service exceeds the available capacity. The team need to achieve several objectives: (i) understand the pattern of demand for the service across NI, (ii) determine best use of limited available resources, and (iii) identify the quantity and type of resources of that would be required to adequately meet demand.

Spatio-temporal modelling will be used to identify hotspot regions and generate a short-term forecast model to simulate spatially and temporally realistic future emergences across NI. This modelling will be used to inform a simulation model of NIAS operations, that can be used to assess various strategies for reducing pressure on NIAS's operations under current resource constraints.

A strong background in Mathematics and Statistics is required for this project. Experience with both R and Python will be considered an advantage.