

Theme:

Using transport data to improve traffic, reduce pollution, and shorten travel times in the Midlands

Area of Focus:

Traffic data modelling and prediction for decision making support

Key Findings:

Smart cities offer an alternative to the polluted, congested, energy-inefficient urban landscapes of today, by supporting green, cost-effective traffic monitoring. Aston University is working to improve transport decision making (e.g. finding the fastest route to work in real time), thus helping local and regional authorities engage with smart, data-driven infrastructure planning.

They have developed traffic models that:

- accurately predict vehicle flow through intricate urban junctions;
- remain accurate for up to nine weeks; and
- can be transferred to a similar junction in a different geographical location.

Digital Innovation:

The technology used to create the traffic models relies on Genetic Programming with Transfer Learning, a cutting-edge computing approach to solving optimisation problems (i.e., finding the best possible solution to a challenge such as traffic prediction). The algorithm ranks potential models on their ability to capture known vehicle flows. These models are then merged to produce predictions of future vehicle flows. The Transfer Learning component is a fine-tuning mechanism that exposes models to data collected from different junctions, making models more robust, thus more likely to predict future patterns.



Midlands Engine Impact:

- Environmental – streamlining traffic reduces carbon footprint
- Financial – the models can inform city expansion and maintenance of road network as well as drive down infrastructure cost
- Convenience – less congestion and real-time route planning to decrease travel times
- Gain insight into digital solutions for intelligent transportation
- Benefit from the opportunity to provide traffic data repositories (in addition to public ones) that the researchers could use to train their models, making the region a leader in this technology
- Take advantage of the invitation to engage in an ongoing conversation with the researchers, to provide feedback on their work and benefit from prototypes and preliminary results



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