# L9 Data Analytics and Visualisation Mini Project Proposal

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| **Student Name: Darragh Sherwin** |
| **Contact Email & Tel No.:** [**s00217114@mail.itsligo.ie**](mailto:s00217114@mail.itsligo.ie) **0871204654 / 0719112930** |
| **Project Title: An interactive map of Great Britain Traffic Accidents** |
| **Description of Project:**  Introduction  Road traffic accidents are a significant issue in our society and pose a major public health concern (Anjuman, Hasanat-E-Rabbi, Kawsar Arefin Siddiqui and Hoque, 2007). Government agencies and road safety organizations spend significant effort in reducing road traffic accidents. In the UK the Department for Transport maintains a very detailed road accident and safety statistic database. In order to effectively reduce the number of accidents, these entities analyse the data in a variety of ways.  Data visualization is a technique used to analyse and display the data in a visual manner. One such technique, Geographical Information Systems (GIS), has become a popular method to visualise traffic accident data (Erdogan, Yilmaz, Baybura and Gullu, 2008). GIS systems allow for spatial analysis of the data (Singh and Katiyar, 2021). Data dashboards allow the analyst to interaction further with the data to narrow selection or focus on a particular area (Razak, Fauzi, Ginning and Jamaluddin, 2019).  Proposal  This project proposes to build an interactive map (GIS) and data dashboard, as outlined in Figure 1, to show road traffic accidents using data from the UK Road Traffic Accidents dataset (Department for Transport, UK; Road traffic statistics, 2021).    Figure 1. Wireframe of data dashboard.  The dashboard will allow the user to select several attributes (such as year, severity, or other data selectors) and change the map to show those accidents based on the as selection. As the user pans or zooms on the data, the dashboard will update the data and visualizations displayed. Some additional visualisations will be based on data attributes that are determined to be significant through statistical analysis and dimensionality reduction of the data.  By examining the data and identifying the clusters new insights may be ascertained.  Viewing the collision data in the context of a geographical location could give a deep insight, for instance highlighting an aspect of driving that could be targeted by a road safety campaign to make a big positive impact. |
| **Outline plan**   * Clean up data sets * Geographical clustering * Statistical analysis * Dimensionality reduction of data * Restructure data for use in dashboard * Implement outline dashboard * Build GIS component * Connect GIS component to visualisation panel * Test and bugfix dashboard  **References** Anjuman, T., Hasanat-E-Rabbi, S., Kawsar Arefin Siddiqui, C. and Hoque, M., 2007. Road traffic accident: A leading cause of the global burden of public health injuries and fatalities. *Proceedings of the International Conference on Mechanical Engineering 2007 (ICME2007) 29- 31 December 2007, Dhaka, Bangladesh*, pp.29-31.  Erdogan, S., Yilmaz, I., Baybura, T. and Gullu, M., 2008. Geographical information systems aided traffic accident analysis system case study: city of Afyonkarahisar. *Accident Analysis & Prevention*, 40(1), pp.174-181.  Feng, M., Zheng, J., Ren, J. and Liu, Y., 2020. Towards Big Data Analytics and Mining for UK Traffic Accident Analysis, Visualization & Prediction. *Proceedings of the 2020 12th International Conference on Machine Learning and Computing*,.  Razak, M., Fauzi, S., Ginning, R. and Jamaluddin, M., 2019. Data visualisation of vehicle crash using interactive map and data dashboard. *Indonesian Journal of Electrical Engineering and Computer Science*, 13(3).  Roadtraffic.dft.gov.uk. 2021. *UK Road traffic statistics*. [online] Available at: <https://roadtraffic.dft.gov.uk/custom-downloads/road-accidents/reports/551709e2-a051-4471-8b98-e14414ccbd70> [Accessed 3 December 2021].  Singh, N. and Katiyar, S., 2021. Application of geographical information system (GIS) in reducing accident blackspots and in planning of a safer urban road network: A review. *Ecological Informatics*, 66, p.101436. |

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