PhD Advert Template

Project title: Alignment consistency, forward visibility and road safety on undesigned roads

Project ID *(optional)*: *Please leave blank*

Accept all year-round applications

Funding information: Self-funded students only

Project description:

Road traffic crashes are a major cause of injury and premature death in many countries of the world. This problem has received much attention over recent years with actions such as the UN Decade for Road Safety, the development of a safe systems approach to designing safer roads and other initiatives to improve road safety.

Roads that have been designed to modern standards will take into account factors such as dynamic stability of vehicles on curves, safe braking distances and other geometric or physical parameters. However large proportions of the highway network remain undesigned, following historic alignments with no rationale based on modern design parameters. Busier roads tend to attract more funding for improvement, meaning that the minor road network remains unimproved, presenting a higher risk to road users, per mile travelled, than designed or realigned roads.

It has been hypothesised that consistency of alignment parameters could be a method of predicting risky locations where local small-scale improvements could reduce accident risks at a fraction of the cost of realigning whole

sections of highway. An operating speed model is necessary for this type of analysis, to predict drivers’ choice of speed. Input parameters for these studies have, in the past, been geometric factors related to the road layout an dimensions. This study’s hypothesis is that forward visibility could provide a better speed operating model for predicting drivers’ speed choice than current geometry-based models.

Measurement of forward visibility has not been practical in the past, but can now be achieved using new mobile laser scanning and manipulation of the resulting point data. The study could yield an improved speed operating model for use by highway designers and road safety practitioners.

This PhD project will initially investigate the current state of knowledge in highway design consistency analysis. It will also assess the potential use and application of the latest mobile laser scanning techniques to survey the properties of lengths of highway including forward visibility. Through trial surveys, these parameters can then be applied to update current speed operating models, investigate whether forward visibility can be linked to drivers’ choice of speed and to the location of accidents, and devise more reliable consistency criteria to guide investment in road safety.

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References (optional):

Application enquires: Mr Roger Bird, [roger.bird@ncl.ac.uk](mailto:roger.bird@ncl.ac.uk)

*https://www.ncl.ac.uk/engineering/staff/profile/rogerbird.html*

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developmental biology

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environmental biology

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human genetics

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molecular biology

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public relations

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networks

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drama

fashion

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graphic design

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music

music technology

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econometrics

financial economics

macroeconomics

microeconomics

political economics

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Education

further education

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nursery education

primary education

secondary education

special needs education

other

Engineering

acoustics engineering

aerospace engineering

atomic engineering

automotive engineering

bioengineering

biomedical engineering

chemical engineering

civil engineering

communications engineering

control systems

cybernetics

dynamics

electrical engineering

electronic engineering

energy technologies

environmental engineering

fluid mechanics

gas engineering

geotechnical engineering

integrated engineering

manufacturing engineering

marine engineering

mechanical engineering

mechanics

mechatronics

nanotechnology

offshore engineering

petroleum engineering

robotics

solid mechanics

structural engineering

structural mechanics

systems engineering

thermodynamics

other

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hydrology

marine sciences

meteorology

pollution

soil science

other

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history

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medieval history

military history

modern history

russian history

social history

world history

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information systems

librarianship

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african studies

american studies

asian studies

australasian studies

chinese

danish

dutch

english language

english literature

european studies

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french

german

italian

japanese

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russian

spanish

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Law

criminal law

commercial law

contract law

property law

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Linguistics & Classics

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celtic studies

classics

latin

linguistics

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ceramics

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metallurgy

polymers

textiles

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probability

pure mathematics

statistics

stochastic processes

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audiology

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cardiology

complementary medicine

dentistry

endocrinology

epidemiology

neural engineering

neurology

nutrition

ophthalmology

optometry

pathology

pharmacology

pharmacy

physiology

physiotherapy

podiatry

radiology

speech science

tissue engineering

toxicology

other

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health informatics

medical nursing

mental health nursing

midwifery

occupational health

occupational therapy

paediatric nursing

paramedical science

surgical nursing

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metaphysics

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astronomy

astrophysics

chemical physics

computational physics

electromagnetism

environmental physics

experimental physics

medical physics

nuclear physics

optical physics

particle physics

quantum mechanics

solid state physics

space science

theoretical physics

other

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public policy

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clinical psychology

community psychology

counselling psychology

developmental psychology

educational psychology

forensic psychology

health psychology

neuropsychology

occupational psychology

organisational psychology

psychotherapy

sport psychology

other

Sociology

criminology

disability studies

gender studies

socio economics

social work

other

Sport & Exercise Science

sport coaching

sport development

sport performance

sport technology

sport therapy

other

Theology & Religious Studies

divinity

religious studies

theology

other

Veterinary Sciences

animal welfare

veterinary dentistry

veterinary medicine

veterinary nursing

veterinary nutrition

veterinary pathology

other