INSTINCt

The INfluence of a Signal OpTImiser oN Route Choices

Urie Bezuidenhout MSc.(Eng.)
(PhD Candidate -Univ. of Auckland)

Supervisors Dr P Ranjitkar, Dr J Wang

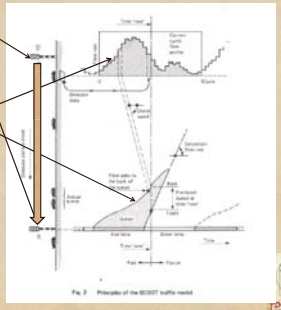
IPENZ 2011, Auckland

Previous Research

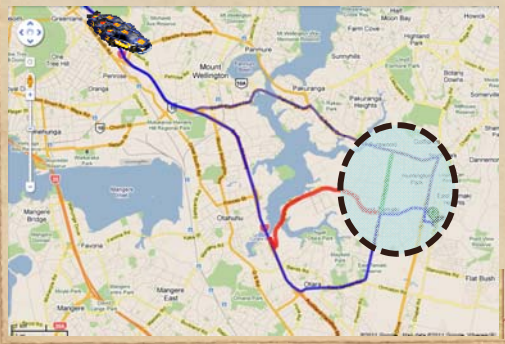
(MUSIC)
Management of traffic Using SIgnal Control

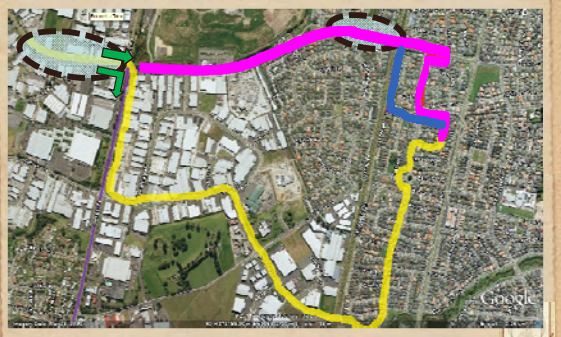
Objectives of research

- **Signal Optimisation**
  - Improve offset algorithm
  - Active and passive techniques
- **Understand**
  - Platoon dispersion
  - Queues
- **Empirical vs. Psychological**
  - Visual perception
  - Steering changes
  - Velocity changes
- **Route Choices**



Gross Route Choice





Signal Approach

Models-Predictions-Forecasts

Engineers	vehicles ~ infer driver behaviour
Economists	money ~ derive choices.
Geographers	historical data ~ how we travel
Psychologists	simulation ~ how we could react
Mathematicians	ideal world ~ how we should react

Psycogineering

Psychology +cognition **Engineering** +

Psychology	Engineering
Stimuli Visual perception Cognition Sensorimotor action Feedback	Control Signal Control
Behavioural Model Eye fixations Saccades Gaze tracking	Behavioural Model Queue Dispersion Platoon Dispersion Queue Formation

Perception

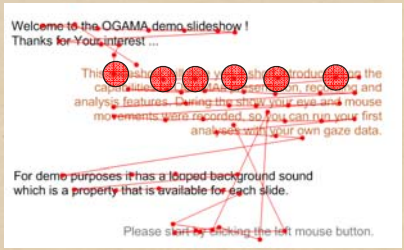
Visual sensation ➔ sensorimotor system

Eye Fixations ➔ to perceive and remember

Eye Saccades ➔ memory blanking

No Visual Memory ➔ spatial and object encoding

Fixation and Saccades

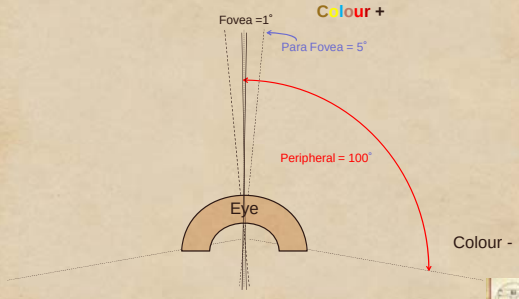


Eye Tracking

Fixation ➔ path and tracking

Gaze saliency ➔ scan path and duration

Physiology



Foveal vision

Limitations

Change Blindness

Scan paths

Saliency

Comparisons

Data collection

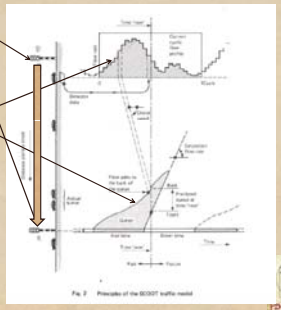
Instrumented Vehicle

Simulated

Traficon Video Detection

Objectives of research

- **Signal Optimisation**
  - Improve offset algorithm
  - Active and passive techniques
- **Understand**
  - Platoon dispersion
  - Queues
- **Empirical vs. Psychological**
  - Visual perception
  - Steering changes
  - Velocity changes
- **Route Choices**



QUESTION TIME

urie@davincitransport.co.nz
+64 (0)21 367 516