Virtual Reality Experiments in the Study of Migrant Integration

Preliminary Ideas

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Stated Preference/Choice Experiments

- Controlled environment for hypothetical/forthcoming situations
- Used in a variety of discipline (mobility, marketing, insurance, etc.)
- Used to understand the new choice preferences
- Typically, pivoted on revealed preferences
- Provides control over the sample demographics and variables
- Typical tools: pen/paper, web, or phone interviews
Role of Virtual Reality

- Useful tool for cases where the technology/service/scenario are:
  - Complex
  - New and unfamiliar
  - Without a baseline to relate to

- Comparison with text and animations/videos (Farooq et al. 2018)
Virtual Immersive Reality Environment (VIRE)

Scenario Development

Virtual Environment Projection System

Multi-Modal Traffic Micro-Simulator

Response & Movement Tracking System

Naturalistic Dataset

Environment

Action

Reward

Agent

State

a. Data Collection

b. Training
Pedestrian-AV interactions

Pedestrian-AV interactions
Control Issues in Partial-AV (Level 2-3)

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Immigration Preferences/Choices Situation

Similarities

- Lack of complete context
- Complexity of the environment, one is moving into
  - Not completely explainable by pamphlets and online material
- Choices made with limited information
  - Big personal and family consequences
Understanding Neighbourhood Choice Decisions

Stated Choice Experiment using VR

- Research questions
  - What are the key neighbourhood attributes that affect the choice?
  - How the demographics of the neighbourhood affect the decisions?
  - How the characteristics of immigrant (decision maker) affect their choices?
Understanding Neighbourhood Choice Decisions

Stated Choice Experiment using VR

- Immersion into the scene required, but no dynamics
- 3D videos of actual neighbourhoods can be recorded
- Using smartphone and cheap cardboard VR, the videos can be displayed
- Questionnaires can be developed around this tool to address the research questions
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VR is a useful tool to understand choice behaviour in forthcoming situations.

Also useful in preparing/training individuals and making well-informed decisions.
Some Issues Around VR Usage

- VR learning curve & development cycle
- How much is real enough?
- (Serious?) game
- Is this a stated (or revealed) preference experiment?
- Motion sickness and duration of the experiment
- Extraction of the right variables for modelling
- Consistency of models and their assumptions
Thanks very much for your attention!