Literature Review

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Contents

What is this section about?

- Pedestrian modelling, and the use of agent-based modelling to achieve this
- Methods to analyse agent-based models and ensure that they are accurate
- The work that currently exists regarding the application of data assimilation methods to agent-based models, and the gap(s) in this field that we aim to fill

1 Pedestrian Modelling

- What is pedestrian modelling?
- Why should we care?

2 Agent-Based Modelling

- How does agent-based modelling fit into this?
- What is agent-based modelling?
- Why should we use it?

2.1 Model Description

- How do we go about describing ABMs?
  - Systematically in words (ODD) [1]
  - Computationally/algorithmically [2]
  - Mathematically [3, 4]

2.2 Model Design Concepts

- What concepts feed into our model design process? [5]
  - Emergence
  - Observation
  - Sensing
  - Adaptive behaviour
  - Prediction
  - Interaction

  - Scheduling
  - Stochasticity
  - Collectives

2.3 Limitations

3 Model Analysis

3.1 Validation

- [6]
- [7]
- [8]

3.2 Sensitivity Analysis

- What does it mean to perform sensitivity analysis?
- Why do we do it?
- How do we do it? [9, 10]

3.3 Calibration

- Calibration of ABMs
  - Different methods of model calibration [9]
- Pros and cons of different methods

4 Data Assimilation for Agent-Based Models

- What work has been done so far with data assimilation for ABMs [11, 12]
  - How valid/useful is this work?
  - What issues are there with this work?
- What gaps exist in the field?
- What can we do about them?

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