XXXX Particle Filter Paper *

XXXX Authors

No Institute Given

Abstract. XX ABSTRACT

Keywords: Agent-based modelling · Particle Filter · Uncertainty · Data assimilation · Bayesian inference

1 Introduction

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Aim:

2 Background

- How people have tried to do state (and parameter?) estimation in ABMs before
- Difference between normal parameter estimation with a (e.g.) GA and dynamic state estimation
- Data assimilation methods, focussing on Particle Filter
- Data assimilation methods in ABM (will be brief!)

3 Method

- Intro to station sim. Point to ODD
- Intro to particle filter
- Outline of experiments, including criteria to measure 'success' of the PF

Assumptions:

- Assume PF knows initial conditions

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4 Experiments

4.1 Experiments with Uncertainty

Purpose here is basically to see how the particle filter behaves when we give it l

1. Randomness in particles
2. Measurement noise (external)
3. Internal randomness (e.g. in agent behaviour)
4. (Simultaneous combinations of different randomness)

4.2 Experiments with Measurement Noise

1. Reduce the amount of information given to the particle filter (e.g. only allow it to optimise half of the state vector).
2. Aggregate the measurements (e.g. counts per area rather than individual traces).

5 Conclusion

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