

Contents

1 General comments

This section is about explaining the estimation process of your model. You start off talking about MH within Gibbs, but don't actually say anything about it. That's great since it's probably straightforward (details in the appendix), but when you started it off I expected to read about the updates, etc. But then you start talking about un-identifiability of the orientation of the latent positions. You prove a theorem that says you only worry about the first timestep and then show that you can use a procrustes transformation to mitigate some of these issues.

Judging just by size, the main point of this section is not estimation, but the unidentifiability of the latent positions. Make that the focus. I didn't get much out of the first section (before 3.1) and 3.3 and 3.4 are very short at the moment. It could work as (Intro, 3.3, 3.4) and then a new section with 3.1 and 3.2)

The mathematical content is good. The proofs were clear and convincing. You do have a lot of white space around the math which you should remove.

Overall, the language seems a bit informal. It felt very conversational, especially in the proofs which is probably not right for a journal article.

2 Specific comments

- First paragraph, second sentence: "lets look" seems too informal
- Equation 5: I'm not sure what I'm supposed to get out of equation 5. Maybe explain in text what's important about this equation or replace it with a plate diagram
- Pg 6, first line: you start the sentence with math μ_z, Σ_0 , etc
- Pg 6, Sentence before 3.1: "You end with a scaffolding sentence, in the rest of this section we discuss..." which isn't strictly necessary
- Pg 6, first sentence of 6.1: This needs a bit more context for a skim reader (and people are not going to read a section that starts with "we use MH withing Gibbs" unless implementing it themselves). Maybe move the previous paragraph down here.

- Theorem 3.1: Maybe make the claim more distinct by bolding it. Also, I don't understand the role of the second sentence, is "we may fix..." part of the setup or part of the claim?
- Theorem 3.1 Proof: The language in the proof seems informal like you would use explaining it at a chalkboard. Maybe formalize it a little more, and deal with the cases more formally
- Location 323: This would be nice to have before the theorem so the reader knows why the Theorem matters
- Theorem 3.2: To be consistent with Thm 3.1 have a claim section.
- Location 510: I don't know why the sentence "The likelihood in equation 5 can be rewritten as" is important. Make this clearer
- Equation 9: missing a $)$ on LHS
- Equation 9: I don't know where this is coming from. I thought it was just a restatement that MCMC draws approximate integrals, but then there's these N terms which I don't know what they are. Also, why do we need to know the pdf when we just use posterior draws which is just the conclusion of the next equation (@536)?