Dissertation TOC

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I. Introduction

Introduce main components of thesis (bdots, saccade curve, other) in context of VWP. What is the state of things, what have we contributed, etc.,.). It is generally understood that each of the sections of this thesis will be stand alone documents

II. `bdots`

Overview of bdots package, use cases, extensions, and examples

1. Fitting

   Review of major changes to fitting process, a mathematical description of the internal code, demonstration of use cases and extensions to generic functions

   i. User-created curves
   ii. Grouping
   iii. Generics

2. Bootstrap

   Review of major changes to bootstrapping process, a mathematical description of the internal code, demonstration of use cases and extensions to generic functions. Extra attention given to analysis of results

   i. Formula syntax
   ii. Bootstrap process
   iii. Generics

3. Extensions

   Here we consider major extensions made to the bdots package not mentioned above. This includes ancillary functions for analysis of vwp data, as well as demonstrated extensions to non-vwp data

   i. Correlation function
   ii. Refitting step
   iii. Non-vwp data

III. "Saccade" Curve

Note: We are still looking for an apt descriptor of this curve. On one hand, the actual data that we are observing come from the saccades themselves, although what we are hoping to recover lays closer to the underlying activation state. Naming this a "saccade" curves appears to put undue emphasis on the ocular mechanics as opposed to the latent cognitive process.

This section introduces the bulk of the theoretical contributions made to the VWP paradigm, namely the focus on the data generating mechanism producing saccades as well as the recovery of this underlying curve. A comparison will be made with existing methods, with enumerated advantages for the proposed method

1. VWP Overview

   Provide introduction to VWP, stated goals, review of current methods

   i. Competition and activation
   ii. History, "looking" curve
   iii. Review of current methods

2. Saccade Curve

   i. Definitions
   ii. Mathematical description
   iii. Discussion

3. Simulations

   With the simulations here, we are hoping to highlight three things: First, a situation in which the occulomotor delay is known. In this case, we are able to perfectly recover the data-generating curve. In the second case, the delay is fixed, but unknown; there is still bias, but the result is a horizontal shift in the curve. Finally, we consider the case in which the delay is both random and unknown. We consider the implications of this, along with various methods to mitigate our uncertainty in recovering the data-generating curve.

   i. Known delay
   ii. Unknown fixed delay
   iii. Unknown random delay

4. Discussion

   Review implications of what was found. Leave space for further inquiries

IV. Other

tbd

1. Time window sensitivity (?)
2. Incorporate fixation length/joint modeling (?)
3. Real-world data/validation (?)

V. Discussion

Here, we investigate the perennial question of our existence: what's the point?