

Using Machine Learning for reducing training in mice experiments

Rebecca Killick (r.killick@lancs.ac.uk)
July 2025

- My research area
- Collaborations
- Reducing training in mice
- Where do we go from here?

Who am I?



- Professor in Statistics
- Specialize in collaborative impactful research
- Developing learning methods for analyzing data whose statistical properties change over time.

Who am I?

- Professor in Statistics
- Specialize in collaborative impactful research
- Developing learning methods for analyzing data whose statistical properties change over time.

But what does that mean?

Interesting things?



... in collaboration

140 co-authors over 13 years.

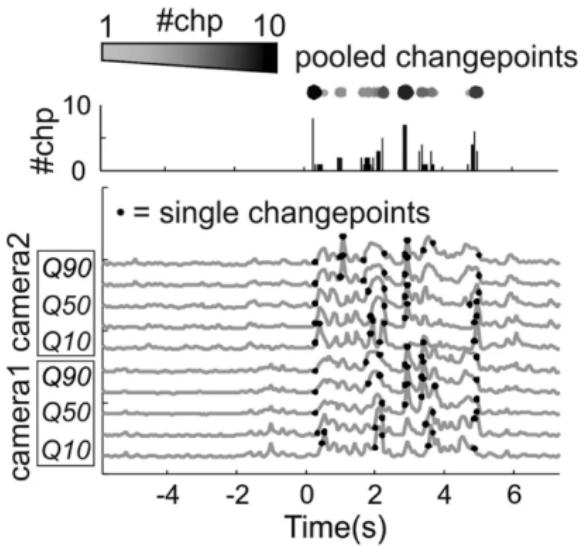
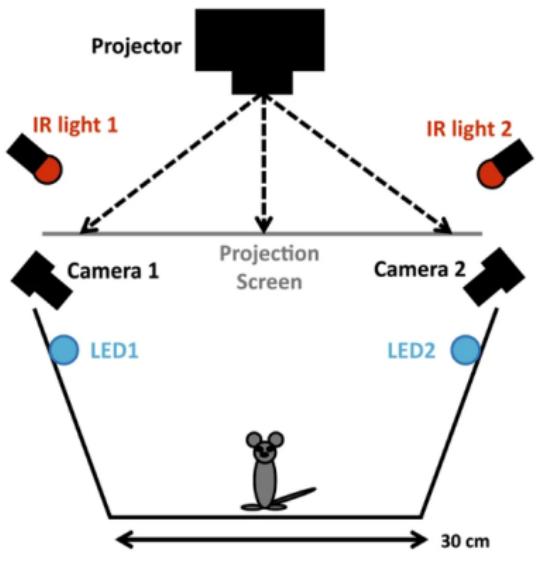




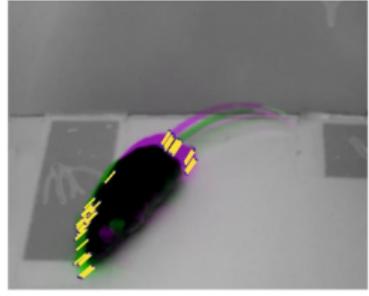
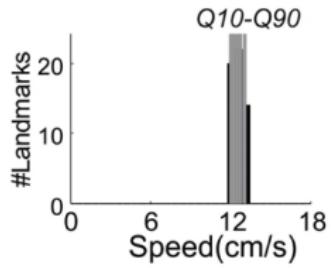
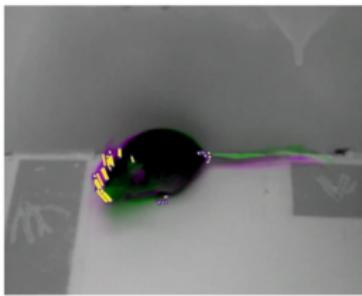
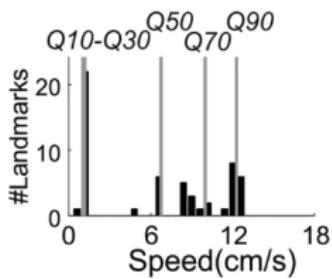
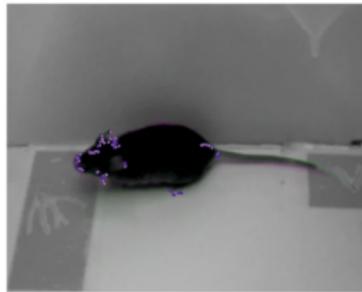
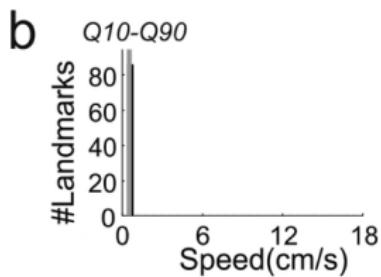
- Riccardo Storchi approached me with an idea
- Want to assess levels of sight in mice
- Previous standard was visual water task
 - Lots of time training mice
 - Training bias in tests
- IDEA: Use innate behaviours and data science techniques

Storchi, R. et al. Measuring vision using innate behaviours in mice with intact and impaired retina function. *Scientific Reports* 9, 10396 (2019).

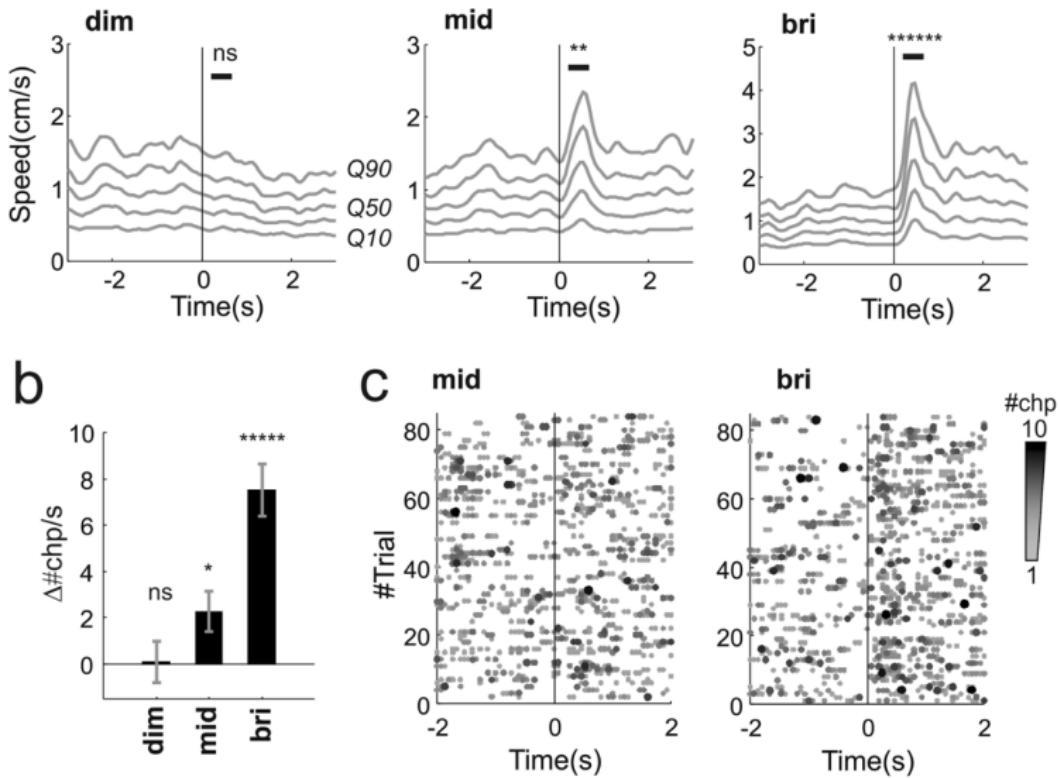
Setup



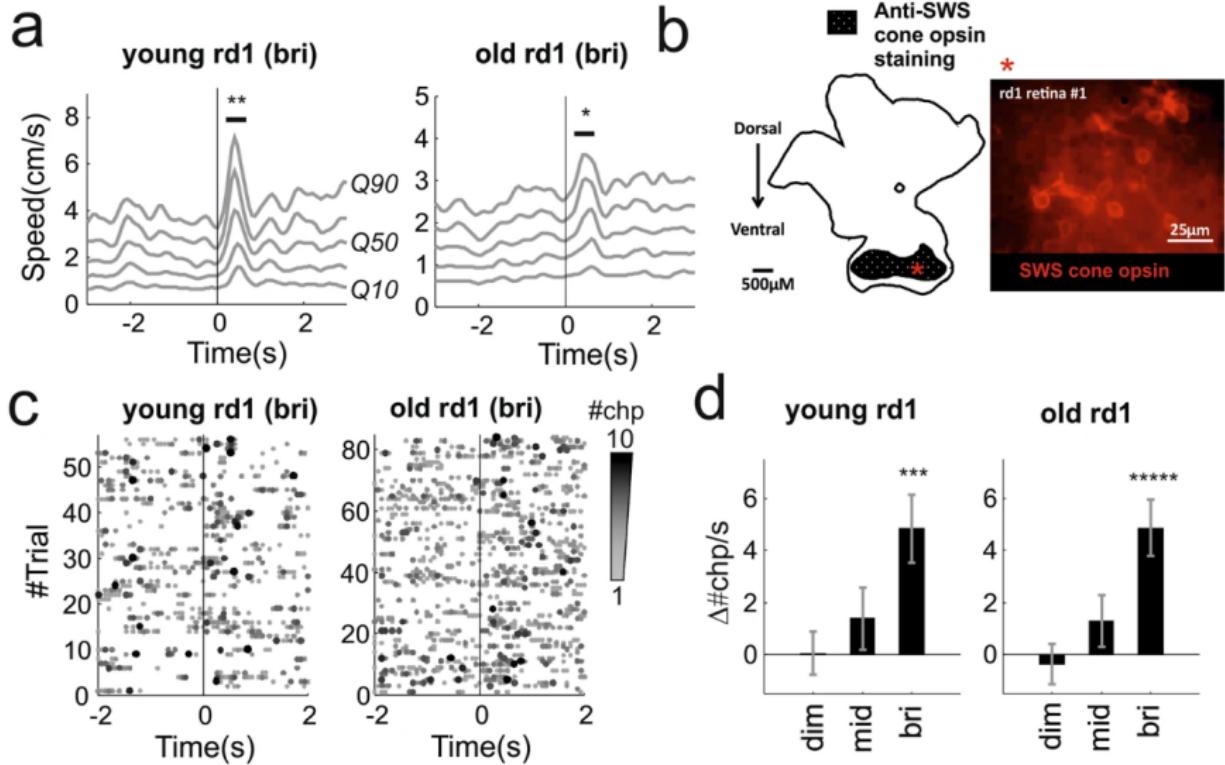
Data



Analysis



Analysis



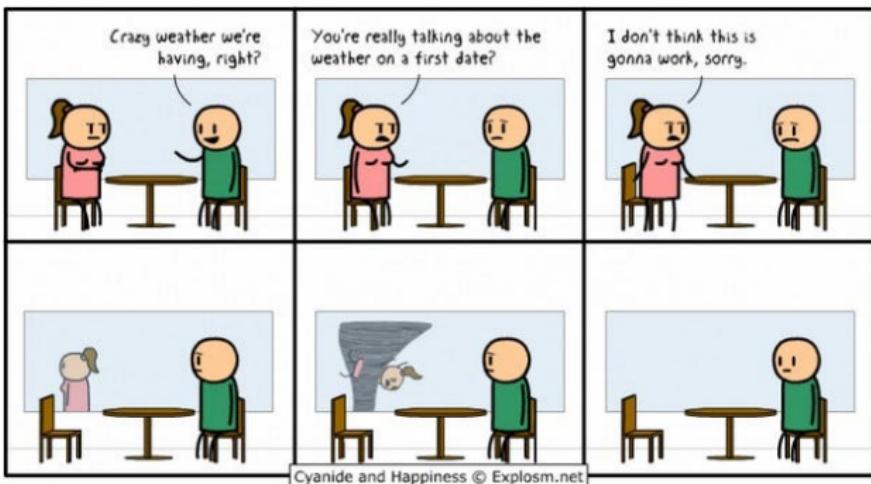
Mice Results

- Found that sight can be determined without training or invasive monitoring
- Approach is fully automatic and reproducible
- Less time and stress for the mice
- Motivated further learning methods research

Storchi, R. et al. Measuring vision using innate behaviours in mice with intact and impaired retina function. *Scientific Reports* 9, 10396 (2019).

Encouragement

Collaboration = academic dating



Summary

- Time series learning methods are under utilised in this area
- They can help advance the 3R's
- Interdisciplinary collaboration is vital
- Huge potential here!