

Detecting (categorical) individual differences in developmental data

Mixture models, latent class models and Markov models for studying change

Workshop by Ingmar Visser at LCICD, August, 2023

Program in brief

10.00-12.30 (Coffee, Tea & Orange Juice, cookies and fruit on arrival):

- Introduction to individual differences and mixtures
- hands-on exercises using data from the depmixS4 and hmmr packages, if desired one can also use one's own data

12.30-14 Lunch Break (Lunch not provided)

14-16.30 (14.30 Coffee, Tea & Orange Juice):

- Introduction to Markov models, modeling change over time
- Hands-on exercises using data from the depmixS4 and hmmr packages, if desired one can also use one's own data

The first parts in both morning and afternoon sessions will be presenting the basics of mixture models and hidden Markov models, respectively. The presentations start from motivating examples, and proceed the conceptual underpinnings of mixture/Markov models, how to interpret such models, and finally how to fit them to data. In the second half of each session the goal is to practice with some of the modeling to deepen the understanding of the underlying concepts.

Visser, I., & Speekenbrink, M. (2010). depmixS4: an R package for hidden Markov models. *Journal of statistical Software*, 36, 1-21.

Visser, I., & Speekenbrink, M. (2022). *Mixture and Hidden Markov Models with R*. Springer.

Preparations

Bring a laptop with RStudio (or R if you prefer) installed as well the R-packages 'depmixS4' and 'hmmr' – the packages will be used for illustrations and hands-on exercises with some of the modelling. Some prior knowledge and skills in R are recommended.

If you have no experience whatsoever, here's one 'getting started' guide:

<https://www.dataquest.io/blog/tutorial-getting-started-with-r-and-rstudio/>

This will guide you through the steps of installing R/RStudio

Here's a slightly longer introduction to the basics of using R/Rstudio, going through basic functions such as reading/writing and manipulating data: <http://r-tutorial.nl/>

If you would like to try your hands at your own data, make sure that you have the data ready, already imported into R in a data.frame in 'long' format (not 'wide' format).