Docket #: S20-280

User-friendly, adaptable, and generalizable software for prediction and analysis of high dimensional time series datasets

Many industries rely on the ability to predict and understand changes over time. Such changes include understanding the economical trend, emergence of infectious disease, and patterns in human behavior. Current software methods train algorithms to identify discrete movement in these time series datasets. However, existing methods are specifically tailored to each scenario of analysis and cannot be used broadly for various situations. The Clandinin lab has invented a user-friendly software tool to process large datasets and make predictions across different contexts and implementations. Unlike other methods, the invention can analyze larger datasets, is computationally efficient, and represents the data continuously (vs discrete time steps). In one application, the lab successfully predicted continuous animal behavior and movement after applying the invented algorithm. Outside of animal research, the invention would be a valuable tool for clinical testing, financial analysis, or disease mapping.

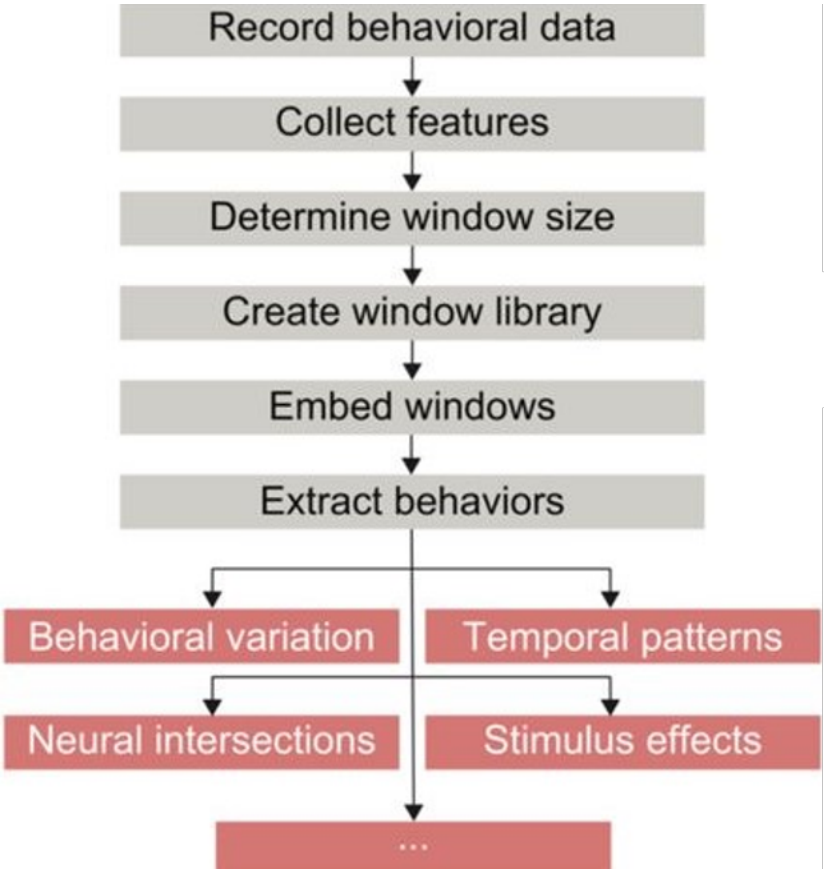

Figure Description: Workflow of generalizable framework for high-throughput behavioral analysis

Stage of Development: Prototype

Applications

- Financial analysis
- Analysis of clinical datasets for drug discovery/interactions
- Sports analytics
- Human movement tracking
- Neurological diagnostics
- Clinical testing
- Animal behavior
- Integration into robotic or automated technology

Advantages

- Can operate on larger datasets than competing methods
- Computationally efficient
- Can be applied to new data types without elaborate training
- Flexibility from continuous representation of behavior, instead of discrete steps

Publications

- York, R. A., Giocomo, L. M., & Clandinin, T. R. (2020). " Flexible analysis of animal behavior via time-resolved manifold embedding." bioRxiv.

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