Sponsor: Prof. Petr Janata (Center for Mind and Brain)

Title: **NeuroBiography Music Memory Browser**

Background: Neurobiographies are maps of music-evoked autobiographical memories (MEAMs) in the brain. Most memories activate many areas of the brain. To facilitate insights into the organization of MEAMs in the brain, new tools are needed for browsing memories in relation to the underlying functional neuroanatomy.

Description: The NeuroBiography Music Memory Browser overlays brain responses (colored pixels) to individual songs on the anatomical fMRI scan of a Music Memory Project (http://musicmemorymap.org) participant's brain, and allows the participant or a researcher to surf the brain images to retrieve the music and memories associated with any given brain region.

The NeuroBiography Browser builds on existing front-end (JavaScript) for displaying a brain viewer with superimposed activations (http://www.neurosynth.org) and fetching of meta-data associated with selected pixels, as well as backend code (Django/Python) for serving data from a graph database (AllegroGraph) that is filled with music and memory data from the Memory Map Project (http://musicmemorymap.org)

Deliverables:
1) An aesthetically pleasing and responsive web application with the following interfaces and features:
- User authentication
- Contextual display of options for selecting which data to view based on user restrictions
- Integration of a an already-written JavaScript brain activation viewer that overlays brain activation data on user-specific anatomical images (jpegs)
- JavaScript for interacting with a Django backend for fetching music and memory data and structuring various views, including memories and music metadata

- Various additional analyses of music/memory/brain data with associated brain display/interaction options, based on group interests, user feedback, and available time.

2) Clearly and thoroughly documented source code maintained in a janatalab Github repository

Contact: 2-4 hours of meeting with the researcher per month

The primary aim of the interface is for a user to be able to hover over a pixel in the brain activation image and have the corresponding memory(ies) appear on the screen with the option of playing the associated song clip. Further features and capabilities can be added as the project progresses based on user feedback.