Closed Loop Optogenetic Control (CLOC) research in the SIPLab

Neuroscientists can gain more insight from the brain with precise manipulation technologies. The Rozell and Stanley labs have already applied basic methods from control theory to do optogenetic feedback control in mice, but there are plenty of potential extensions to this work. PhD student Kyle Johnsen is recruiting students for multiple projects that require varying skill levels in neuroscience, programming, control theory, and biomedical engineering. A minimum 10 hrs/week commitment is expected.

Open projects

- Estimating oscillatory information in real time, for the purpose of closed-loop control, as in this paper, and implementing in easy-to-use code (would involve signal processing, software skills).

Potential skills required or to be learned

- Ability to extract relevant details from scientific publications
- Basics of frequency domain signal processing, dynamical systems
- Scientific Python coding, math (NumPy), and figure generation (matplotlib)
- Software engineering: including source control (Git/GitHub), CI, unit testing, Python packaging
- Ability to explain research and present progress effectively to other students and supervisors

How to apply

If you are interested, please complete the dynamical systems and software sections of this Jupyter notebook and get it to kjohnsen@gatech.edu. Or try your best—don't spend too long on it.