Q1-Mention a research article you read recently and discuss what you enjoyed/disliked most about the work. (600 characters)

I recently read the preprint Feed-forward inhibition fine-tunes response timing in auditory-vocal interactions; they built a leaky integrate-and-fire spiking network model that explains how the strength of local inhibition translates into plasticity, and fast inhibition, suppresses call production while a call is being heard, thereby reducing acoustic overlap between two callers. I like how this computational model with few parameters can explain vocal turn-taking highly consistent with electrophysiological data. I also liked the systematic way in which the different cases of inhibition were considered and tested.
. I liked how location inhibition plays a significant role in more than one scenario. The.

Q2-Which question related to neuroscience you would be excited to answer? How would you approach it? (600 characters)

What excites me most about neuroscience is how information is encoded in networks of neurons.The predictive coding theory seems to give us a better and more holistic understanding of information encoding.I want to use songbird as a model system to identify the canonical circuits involved in sequence generation and vocal interaction, in the light of predictive coding theory. To do this, I would provide incomplete stimuli while recording neural activity. If the neurons indeed fire for the omitted stimuli they would belong to the class that predicts in order to update a songbird's internal generative model

Q3-Discuss your background and any research project(s) you have worked on? (900 characters)

I am an electronics and communication engineer from NIT, Karnataka. After graduation, I worked in Shubha Tole's lab; I analyzed NGS datasets to find differently expressed genes for a Wnt gain and loss of function study to understand the development of choroid plexus in the mouse brain. I used R to implement two algorithms, edgeR, and Deseq2. I learnt a great deal about the workings of the mammalian brain. Later I joined Sanjay Chandrasekharan's group, where I worked with an fMRI dataset to find face processing areas in the human brain. I used NumPy, nibabel, nilearn, sci-kit learn, matplotlib, and more to find the functionally connected brain. This work was presented at the Annual Conference on Cognitive Sciences at IISc. Currently, I am a Ph.D. student in Raghav Rajan's lab, working on building a computational spiking network model of area HVC.

Q4-Describe how this course will help you in achieving your goals? (600 characters)

I am building a mathematical model of a brain area of zebra finch, HVC. Its precise and complex dynamics involve a sophisticated fine-tuning of excitation and inhibition. I hope that CAMP will equip me with tools such as Neuron or Brian, give me enough perspective to choose between different methods, such as HH, Izhikevich, integrate-fire neuron models whenever necessary, and learn how to connect neurons to make a biologically plausible model. Neuromodulation and cell diversity are particularly interesting since the brain area I am interested in has a diverse cell population and connectivity.

Q5- Anything else (600 characters)

I am a strong proponent of the Bayesian Brain Hypothesis. I have closely followed Peter Dayan's work while exploring predictive coding theory. I am particularly interested in his lectures since being a pioneer in unsupervised learning, reinforcement learning (and more); how does one apply Bayesian methods to problems of neuroscience. I would like to have a chance to ask him questions and interact with him to understand from what vantage point he views neuroscience because I was particularly fascinated by his paper The Helmholtz machine written with Geoffry Hinton and Radford Neal (Sounds good)