Summary of Talks related to Episodic memory, Sentience, Social norms and discussion dynamics

COGSCI 595 Cognitive Science Colloquium Final Paper, Spring 2023
Student: Sushma Anand Akoju, Professor: Prof. Mary Peterson

1 Reflection

As a first-year student, enrolled in Cognitive Science Colloquium, it was interesting to research work to learn various directions. A lot of people attended, and I did see more participation from all of the participants in the Colloquium this semester. I am glad I was able to focus and reach my academic goals.

We had at least 4 talks surrounding episodic memory. The hippocampus and episodic memory together provided several clues on how the context can define what is remembered and forgotten when a hippocampus is damaged. This was sad to know that there is no recovery for people who have damaged the hippocampus from accidents, the case studies discussed during the talks. I consider these examples are sad examples of how we have a centralized system that can define the rest of our life and respective journey.

As per talk from Prof. Matt Bedke, who also coincidentally works with Prof. Janet Metcalfe who gave a talk on Metacognition and Curiosity during the Fall of 2022. Prof Matt Bedke provided how the boundaries for authoritative guidance, and normative phenomenology get influenced. On one hand, authoritative guidance helps to provide the grounding required, and on the other hand, it cannot guarantee a broader perspective that is independent of sentiments and one's own impressions outside of authoritative guidance. The normative predicates in epistemology were discussed by Prof. Bedke during the talk which discusses justification and rationality to be more normative than that of descriptive, and subtly introduces scientific i.e. non-naturalistic accounts of properties of concepts. This holds some interesting perspectives on how epistemology itself is designed in practice for example in building knowledge graphs. In short, Prof. Bedke's talk seems to attempt to distinguish between moral opinions versus morality itself. Whether one approves of something or not, something could inherently be immoral irrespective of being influenced by manipulation of emotions or internal impressions and sentiments.
There was a talk by Prof. Nick Strausfeld on Ground patterns, brain evolution, and function across phyla. What information do genes contain/carry through from such evolution within orthologs that share common ancestral genes, for example between humans and arthropods? The professor answered that the circuitry of transcriptions between genes supports the presence of information carried through the evolution within orthologs. During lunch, I asked Prof. Strausfeld also discussed what are his thoughts about Artificial Neural Networks in comparison to Biological Neurons. He suggested that most of the Deep Learning models lack empathy which contributes towards a Collaborative mindset from a moral perspective. He added that the collaboration has empathy and some awareness of others' intentions as suggested by swarms of insects from his studies contributes significantly towards constructing a successful network. Prof. Strausfeld mentioned that it is not possible to create a cognitive capacity for intellect without empathy that can and needs to be designed mathematically, which is lacking in present-day Neural Networks. I did not reach out to the professor, since another student mentioned that he can build a neural network and take insights from his talk, however, the student refused to address the empathy part of intellect toward collaboration. So such a different opinion from another student, brought to light, how people who are not experienced in Neuroscience and its valuable influence on Deep Learning models, have a perception that Deep Learning models do not require mathematical components for morality, empathy, and collaboration. I seemed to have always believed Deep Learning models for Artificial intelligence do require corresponding mathematical components for morality, empathy, and collaboration, derived from Neuroscience. But none of the students who participated in this lunch thought that morality, empathy, and collaboration are very important but missing parts of present-day Artificial Intelligence, which is

direly concerning.
The next interesting point from both Prof. Nick Strausfeld's and Prof. Carl Craver's talks was the mention of sentience and consciousness. I found gene expression and cellular level research for understanding as well as to get some inspiration for defining what Sentience in Artificial Intelligence could be and how it can be defined to add statistical metrics for defining theory for Algorithmic Conscious Turing Machine such as (Blum & Blum, 2022).

There was also a talk from Prof. Martha Farah about the Neuroscience of socioeconomic status: Is it relevant to policy? The talk seems to discuss the question "How does SES manifest in the brain and how do neural correlates relate to causes and consequences itself?". The talk suggested that there are neural, functional, and structural correlates (in that order) of SES suggesting evidence of influence over causes and consequences. One example reference from the talk seems to suggest developmental brain studies of kids and respective lower BMI values could be related to metabolic syndromes (falling below recommended BMI numbers due to SES) and could lead to changes in the mass that possibly correlated to changes in the brain. My question was how do the studies from genetics towards SES reverse confirm the results from the studies of neural, functional, and structural correlates of SES? The answer seems to suggest studies are ongoing but seems to require more studies but do already support the results found so far.

The talk from Prof. Yotam Shmargad was insightful and is more towards a journalistic perspective. Interesting perspective about Social norms and discussion dynamics. My question was : "How can the approval ratings on fivethirtyeight politics, which are in turn gathered from polls, be combined with online twitter/reddit conversations to assess the true polarity of the general public and detect pollster herding from partisan polls ?". Professor suggested that it is an interesting direction and can be explored. In later conversations, I also discussed with the professor about how the jumps in contexts, the interpretative influence of polls be detected during conversations.

Acknowledgements

This course was supervised by Prof. Mary Peterson. I am very grateful for the guidance from Prof. Mary Peterson, and Kirsten Leigh Cloutier Grabo for the discussions and opportunities to learn.

References

Blum, L., & Blum, M. (2022, may). A theory of consciousness from a theoretical computer science perspective: Insights from the conscious turing machine. *Proceedings of the National Academy of Sciences*, *119*(21). Retrieved from https://doi.org/10.1073%2Fpnas.2115934119 DOI: 10.1073/pnas.2115934119