2024 FUN Undergraduate Poster Submission

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Tue 7/9/2024 3:49 PM

To:Remon, Legasse P. <legasseremon@ufl.edu>

[External Email]

Google Forms

Thanks for filling out 2024 FUN Undergraduate Poster Submission

Here's what was received.

Edit response

2024 FUN Undergraduate Poster Submission

The Early Career Poster Session provides an opportunity for early career researchers and members of the neuroscience community to present their research. The session will take place on Saturday, October 5 in Chicago, IL from 6:30—8:30 pm CDT. Complete the following survey to confirm your participation in the session.

This poster session and networking event features early career participants from:

- Various diversity programs, including the Neuroscience Scholars Program (NSP), BP-ENDURE, and the Summer Program in Neuroscience, Excellence and Success (SPINES)
- The Early Career Policy Ambassadors (ECPA)
- **The Faculty for Undergraduate Neuroscience (FUN)**
- International partner organizations, including the Chinese Neuroscience Society (CNS), Federation of European Neuroscience Societies (FENS), International Brain Research Organization (IBRO), and Japan Neuroscience Society (JNS)
- The Trainee Professional Development Awardees (TPDA).

This was historically separated into multiple events and known as the Diversity Poster Session, the Early Career Policy Ambassadors (ECPA) Poster Session, ***the Faculty for Undergraduate Neuroscience (FUN) Poster Session,*** *the International Fellows Poster Session, and the Trainee Professional Development Awardees (TPDA) Poster Session.*

Be aware: Information will be displayed in the program exactly as written. Do not write in ALL CAPS. Double-check your responses before submitting. SfN will not edit submissions.

Email *

legasseremon@ufl.edu

Question 1-12 are collected by SfN, for the purpose of generating the program for the early career poster session, which will be available the week before SfN and onsite.

1. First Name of the Undergraduate Presenter
*

Legasse

2. Last Name of the Undergraduate Presenter
*

Remon

3. Preferred Email of the Undergraduate Presenter *

legasseremon@ufl.edu

4. SfN ID:
(An SfN ID is required to participate in this session. Find your ID by signing into your profile on my.sfn.org.
Don't have an account? Sign up now for your FREE account. You DO NOT need to be a member to participate in this session.)
*

C-079352

5. Name of Institution

*

Princeton University

6. Program Affiliation (select all that apply)

Be sure to choose FUN.

*

- [ ] BP-ENDURE
- [ ] Chinese Neuroscience Society (CNS)
- [ ] D-SPAN
- [ ] Early Career Policy Ambassadors (ECPA)
- [x] Faculty for Undergraduate Neuroscience (FUN)
- [ ] Federation of European Neuroscience Societies (FENS)
- [ ] International Brain Research Organization (IBRO)
- [ ] Japan Neuroscience Society (JNS)
- [ ] NEUROCITY
- [ ] Neuroscience Scholars Program (NSP)
- [ ] Trainee Professional Development Award (TPDA)
- [ ] Summer Program in Neuroscience, Excellence and Success (SPINES)
- [ ] Other:

7. Program Type (select all that apply)

*

- [ ] Diversity
- [ ] International Partner
- [ ] SfN Program
- [x] Undergraduate
- [ ] Other: _____

8. Training Status

*

- (•) Undergraduate Student
- ( ) Graduate Student
- ( ) Postdoctoral Fellow
- ( ) Other: _____

9. Provide the title of your poster.
Double-check your spelling. Responses will be displayed in the program as written. SfN will not edit submissions.

*

The Limits of Vision Language Models Through the Lens of the Binding Problem

10. Please choose a theme for your poster:

*

- ( ) Theme A: Development
- ( ) Theme B: Neural Excitability, Synapses, and Glia
- ( ) Theme C: Neurodegenerative Disorders and Injury
- ( ) Theme D: Sensory Systems
- ( ) Theme E: Motor Systems

- ○ Theme F: Integrative Physiology and Behavior
- ○ Theme G: Motivation and Emotion
- ◉ Theme H: Cognition
- ○ Theme I: Techniques
- ○ Theme J: History, Education, and Society

11. Did you submit an abstract to present this poster for Neuroscience 2024? (*Note: an abstract is not required to present in this session.)
*

- ◉ Yes
- ○ No

If your answer to the above question is Yes, provide the exact title of abstract.

Human-like Capacity Constraints in Vision Language Models

12. I will require ADA accommodations.
*

- ○ Yes
- ◉ No

If your answer to the above question is Yes, please describe the accommodations. You are not required to disclose any personal or medical information.

Questions 13-16 are collected by FUN, for the purpose of eligibility verification and abstract submission.

The abstract book will be posted on the FUN website one week before the SfN.

13. First and Last Name of the Sponsoring FUN Member:

This can be faculty or post doc mentors who are FUN members.

*

Jonathan Cohen

14. Institution of the Sponsoring FUN Member: *

Princeton University

15. Please list all authors and institution affiliations, as they will appear in the abstract book. *

Iain Campbell (Princeton University), Legasse Remon (Princeton University), Webb, T., (University of California, Los Angeles), Jonathan D. Cohen (Princeton University) Abstract book: Campbell, I., Remon, L., Webb, T., Cohen, JD.

16. Abstract of the Poster: (250 words maximum) *

Recent work has documented striking heterogeneity in the performance of state 2 of-the-art vision language models such as GPT-4v and the DALL-E text-to-image models. These models are able to describe and generate an incredibly diverse array of complex, naturalistic images, yet they exhibit surprising failures on basic multi-object reasoning tasks – such as counting, localization, and simple forms of visual analogy – that humans perform with near perfect accuracy. To better understand this puzzling pattern of successes and failures, we draw on theoretical accounts from cognitive science that postulate a fundamental trade-off between representational flexibility (i.e., the use of compositional representations to promote generalization) and channel capacity (i.e., the number of entities that can be represented at any one time). This trade-off gives rise to the classic binding problem, leading to severe constraints on the ability to rapidly process multi-object scenes, and necessitating the use of serial processing to prevent interference. Drawing on this perspective, we hypothesize that VLMs, under pressure for generalization, also learn structured representations, but lack the serial processing mechanisms to effectively use these to process and generate multi-object scenes,

resulting in severe capacity constraints similar to those observed when humans are forced to rely on rapid, parallel visual processing. We test this hypothesis through a combination of classic cognitive tasks and novel benchmarks. Our results provide a unique perspective on VLMs, informed by work in cognitive science, suggesting that their capacity for generalization paradoxically gives rise to many of their most notable limitations, possibly for the same reasons humans exhibit a similar profile of competencies and limitations.