Comprehensive Exams - Distributed Games

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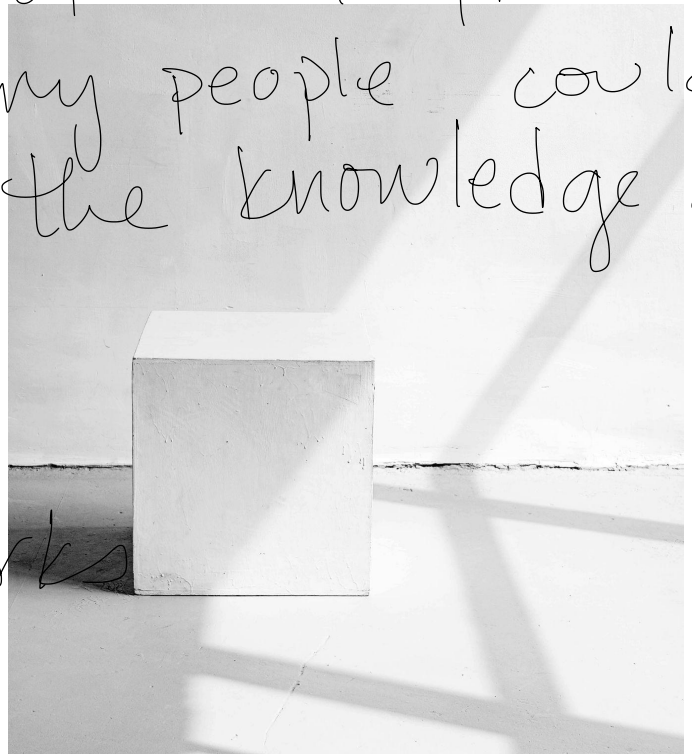
Theoretical Exam - Distributed Epistemic Games

Complex (m^3) Problems

① Introduce concept of a m^3 problem "only so many people could gather round the knowledge & communicate it."



② Opportunity to understand the process to gather, communicate & solve

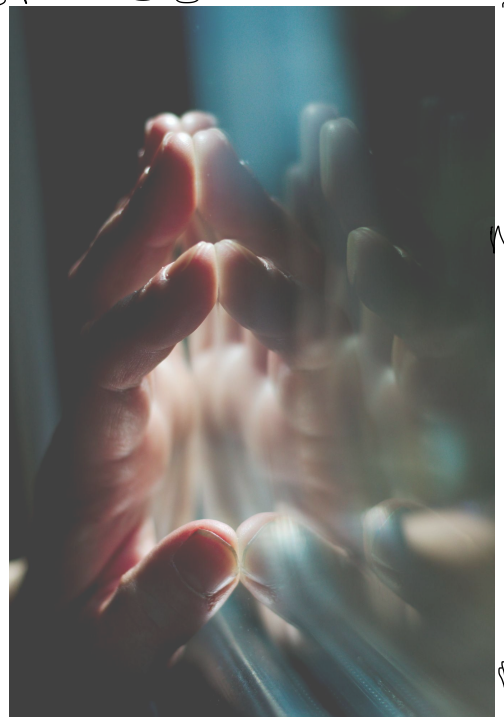
③ use frameworks & build DEG framework

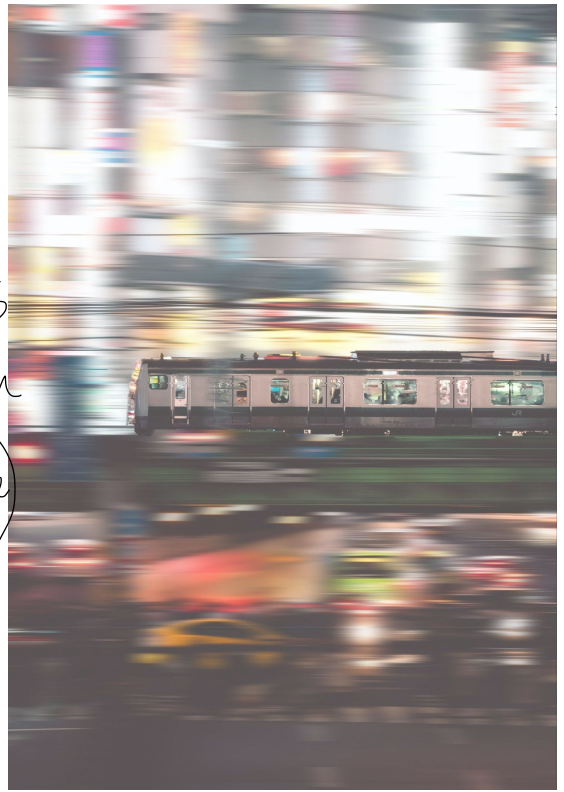
In this paper I describe elements of DEGs, in which multiple players & forms concurrently

Discussion includes tools, forms, players, moves, tactics part of DEG

Distributed Epistemic Games

Finally, discuss next steps incl. different scales (micro to macro), meta reflective processes, & vectors (direction & magnitude)





Next Steps

further understandings refine framework & models & improve

Bradfield

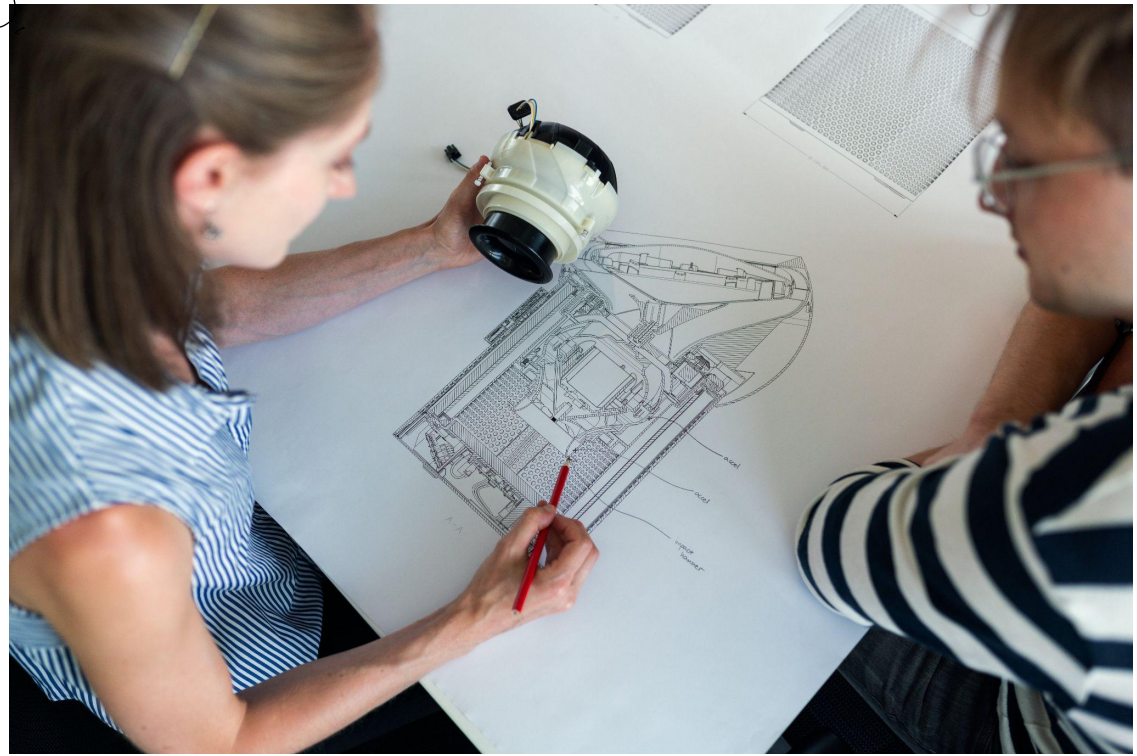
games themselve
to solve more
m3 problems.

Question Time

Empirical Exam - Distributed Design Games

Working in close collaboration with Drs Nguyen & Swanson, empirical paper focuses on defining & describing a d d g. It is inspired by my earlier work

on DEG, as well as Framing & Human-AI interactions



Differs because goal/outcome is a design artifact

Distributed Design Game

For this paper, I used a dataset provided by Dr Nguyen to answer the question:

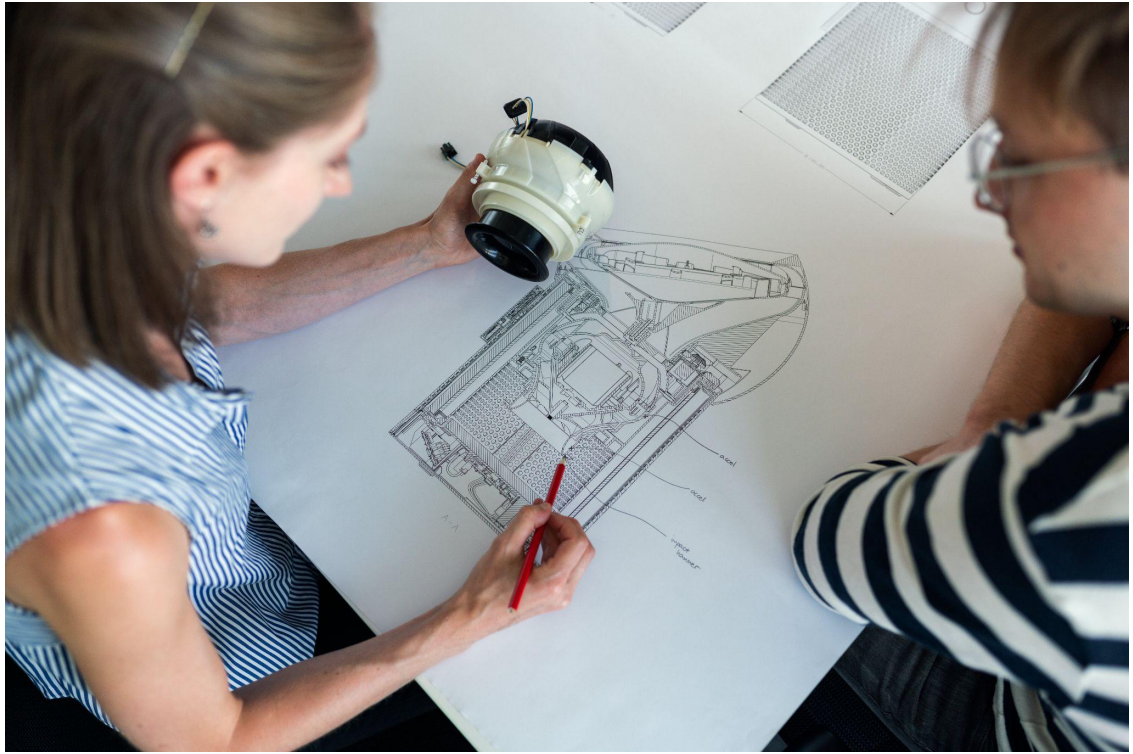
How do designers (in-training and post-training) approach a design task with a generative AI?

Methods & Findings

- Methods
  - Case study of 4 participants
    - 2 in-training (undergraduate students)
    - 2 post-training (one professional, one graduate student)
  - Grounded coding
    - Describe participant *moves* with AI player
- Findings
  - Orientation to AI
  - Game complexity
    - Iterations or turns
    - Different micro-games
    - Subjective & open-ended questions

Contributions

- Theoretical
  - Expanded collective construction framework
    - Added design games (DDGs) to existing framework for epistemic games (DEGs)
- Empirical
  - AI as a player
  - Design as a turn-taking process



Question Time

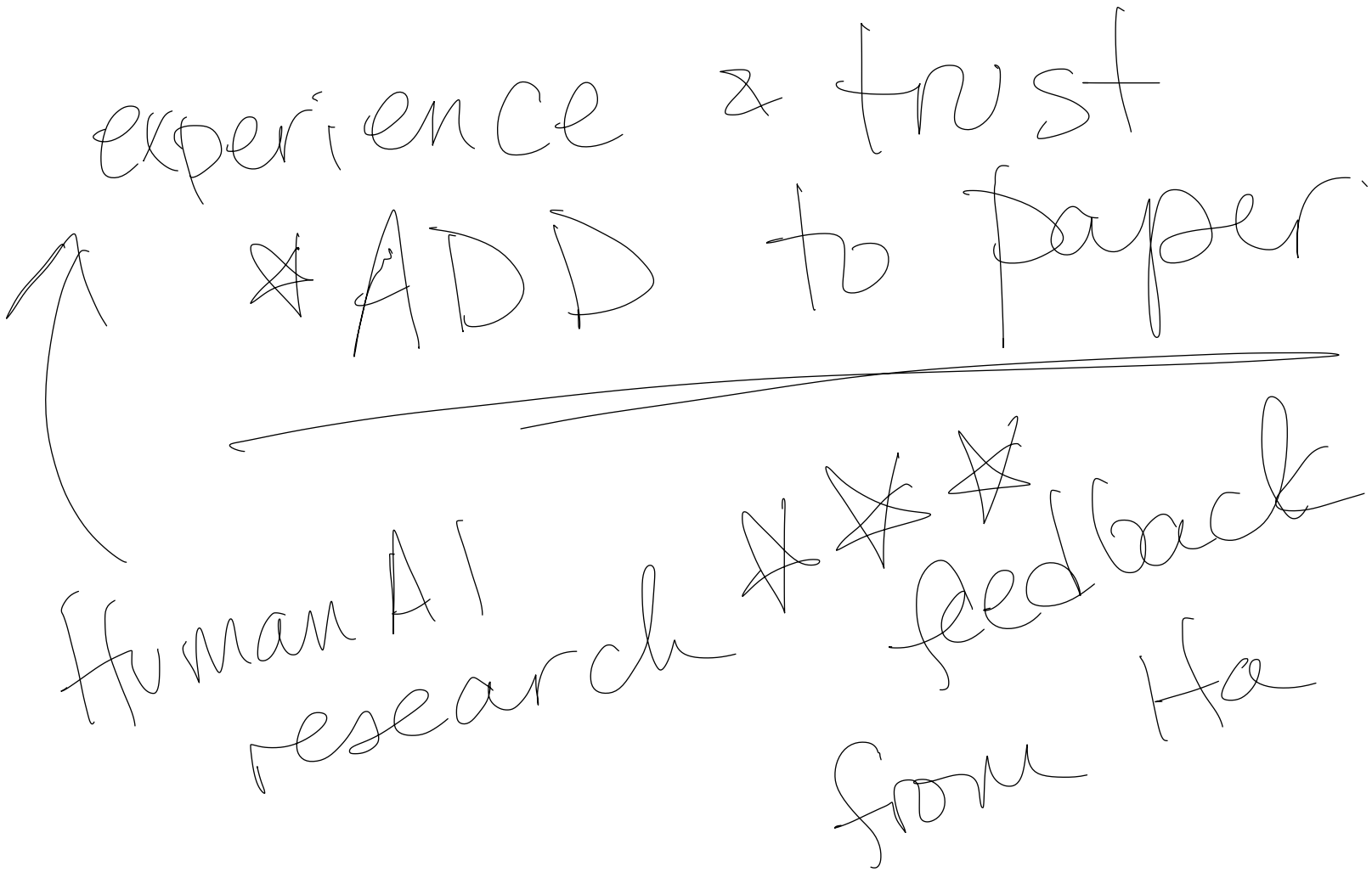
Acknowledgements

Human AI project (Ha Nguyen, PI)

Theory Building Group from Northwestern University - Uri Wilensky, Bruce Sherin, Donna Woods, John Chen

Learning Dynamics Lab from Utah State University - Hillary Swanson, Jared Arnell, Bonni Jones, Ravi Sinha, AlLisia Dawkins, Idris Solola

Artists & team at https://www.pexels.com/


experience & trust
* ADD to paper
Human AI research
feedback
from Ha

* from Debbie - add nice summary for Beth & Catherine to * findings like I did for * * * * UG students

Appendix/Reference Slides

@Debbie - games using C1 & DC

look at this as augmenting (improving creative process) rather than co-learning (discovery) ← my response to Ha query RE how to analyze AI

Playing a Distributed Epistemic Game: Collective Knowledge Construction

Jenna Matthews
Comprehensive Exams - Theoretical
Date

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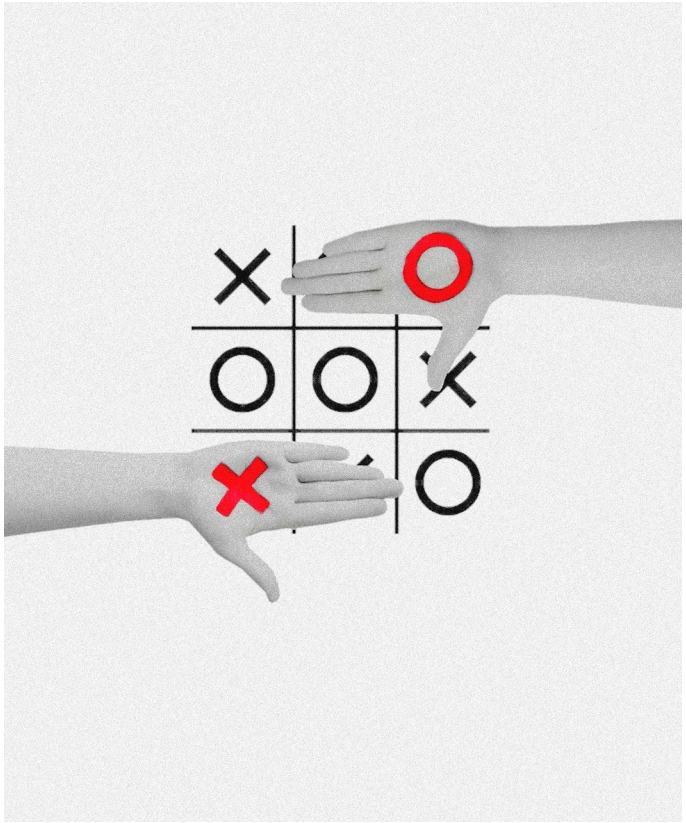
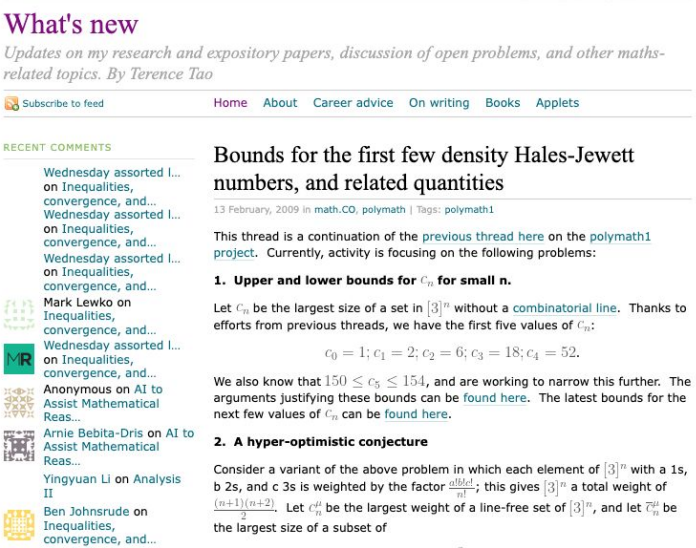


Epistemic Forms & Games

Distributed Cognition

Tools

Distributing



What's new

Updates on my research and expository papers, discussion of open problems, and other maths-related topics. By Terence Tao

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Bounds for the first few density Hales-Jewett numbers, and related quantities

13 February, 2009 in math.CO, polymath | Tags: polymath1

This thread is a continuation of the previous thread here on the polymath1 project. Currently, activity is focusing on the following problems:

1. Upper and lower bounds for c_n for small n.

Let c_n be the largest size of a set in $[3]^n$ without a combinatorial line. Thanks to efforts from previous threads, we have the first five values of c_n:

$$c_0 = 1; c_1 = 2; c_2 = 6; c_3 = 18; c_4 = 52.$$

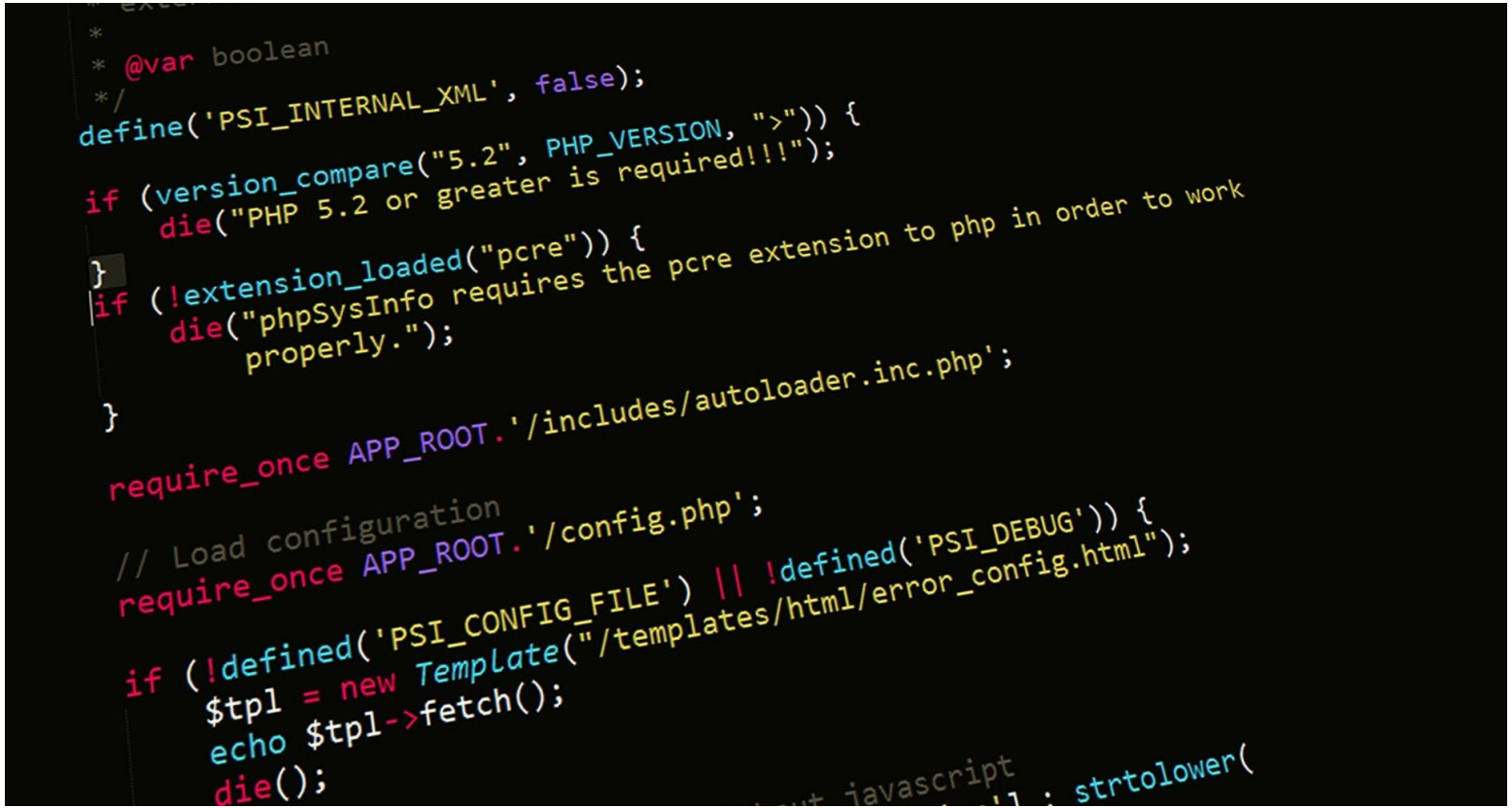
We also know that $150 \leq c_5 \leq 154$, and are working to narrow this further. The arguments justifying these bounds can be found here. The latest bounds for the next few values of c_n can be found here.

2. A hyper-optimistic conjecture

Consider a variant of the above problem in which each element of $[3]^n$ with a 1s, b 2s, and c 3s is weighted by the factor $\frac{a!b!c!}{n!}$; this gives $[3]^n$ a total weight of $\frac{(n+1)(n+2)}{2}$. Let c_n^μ be the largest weight of a line-free set of $[3]^n$, and let $\overline{c}_n^\mu$ be the largest size of a subset of

Discreet/Discrete

The Players



Forms in a Distributed Epistemic Game

Moves & Tactics

Acknowledgements

NSF DRL (1842375)

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Learning Dynamics Lab from Utah State University - Jared Arnell, Bonni Jones, Ravi Sinha, AlLisia Dawkins, Idris Solola

Artists & team at https://www.pexels.com/

Give me *ideas* or give me *lists*: Role Definition in a Distributed Design Game

Jenna Matthews
Comprehensive Exams - Empirical
Date

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Theoretical Foundations

Data Set

- Summer 2023 Data Collection
  - Participants - 17 in the group
    - 6 *designers in-training* (undergraduate students)
    - 11 *designers post-training*
      - 7 professionals
      - 4 graduate students
- Post-study access to data, including
  - Videos of zoom sessions
  - Transcripts
  - Scores on design sketch (from the end of the interview)

Method

Case study using 4 participants

- Selection using design sketch score
  - *Designers in-training* (undergraduate students)
    - extreme sampling based on design sketch score
  - *Designers post-training*
    - Professional - highest score
    - Graduate student - lowest score

Reviewed & coded transcripts - focusing on participant interactions with ChatGPT

Findings - Defining Roles

(low trust & low familiarity) - define the problem space **Barbara is completely new to the AI player, so she spends her session asking basic questions with simple follow-ups like “tell me more”.**	

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(low trust & low familiarity) - define the problem space Barbara is completely new to the AI player, so she spends her session asking basic questions with simple follow-ups like “tell me more”.	**(low trust & high familiarity) - reluctant regeneration** **Catherine has worked with ChatGPT before, but doesn’t trust the responses and is reluctant to engage at all. She asks simple questions and disengages before the session is over, coming back to challenge the AI to “regenerate the response” to see if the answers are consistent.**

Findings - Defining Roles

(high trust & low familiarity) - useful assistant **Beth orients to the AI player as a useful assistant, running through a variety of micro-games during her turns.** **Not all of her prompts are successful, showing that she is still building familiarity with how to approach & use the AI. She does display trust though, including asking subjective questions using rankings like “best” and “most boring”.**	
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Findings - Defining Roles

(high trust & low familiarity) - useful assistant Beth orients to the AI player as a useful assistant, running through a variety of micro-games during her turns. Not all of her prompts are successful, showing that she is still building familiarity with how to approach & use the AI. She does display trust though, including asking subjective questions using rankings like “best” and “most boring”.	**(high trust & high familiarity) - guided roleplay** **John orients to the AI player as a junior partner and engages in a guided roleplay throughout his session. He repeatedly demonstrates familiarity with ChatGPT - showing clear prompt engineering and comfort engaging with an AI player and even checking “do you understand?” to make sure that his prompts are working.**
(low trust & low familiarity) - define the problem space Barbara is completely new to the AI player, so she spends her session asking basic questions with simple follow-ups like “tell me more”.	(low trust & high familiarity) - reluctant regeneration Catherine has worked with ChatGPT before, but doesn’t trust the responses and is reluctant to engage at all. She asks simple questions and disengages before the session is over, coming back to challenge the AI to “regenerate the response” to see if the answers are consistent.

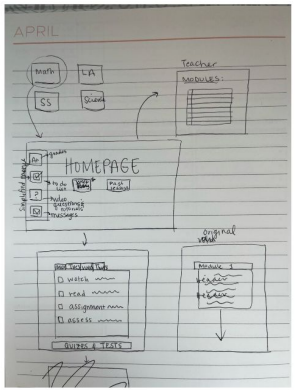
Findings - Complexity in the macro-game (session)

- Quick iterations
- Increased interactions
- Variation in micro-games (1 or more turns)
- Subjectivity
- Open-ended questions

Discussion

- Expanded collective construction
  - Added design games (DDGs) to existing framework for epistemic games (DEGs)
- Four case studies to show differences in both orientation & game complexity
- AI players

Idea Description: A more simplified, easier to navigate version of Canvas dashboard … divided by subject … swapping the to-do list up and having it in calendar views. I also included video help and FAQs. And I added a "message the teacher" button. […] Originally, I was thinking to condense the sidebar menu, but ***talking to ChatGPT made me realize that the problems came from navigating Canvas***. So I added the video questions and tutorials. When I started talking about special education educations and ***we did the user profiles [for ChatGPT], I thought of accessibility*** because it's annoying for my special education students to scroll so much even for one week, so then I thought of the whole week layout.



Novelty (0 = solution already exists; 5 = solution is entirely different from what exists)
Score of 2 (the main solution of swapping or omitting sessions already exists).

Usefulness (0 = does not address prompt; 5 = solves the design problem effectively)
Score of 5 (solves the problem of navigation; considers several use cases for higher education as well as special education students in K-12).

Elaboration (0 = does not include details; 5 = includes enough detail that a designer could implement the solution)
Score of 4 (includes sufficient details in sketches and verbal descriptions for the sidebar menu; needs more details about the FAQ feature and implementation).

Idea Incorporation (0 = does not include AI conversations; 5 = incorporates several points from conversations into solution)
Score of 3 (brings in icons and use cases from conversations with AI; largely one's own thinking about the sidebar menu).

Scoring participant designs

Grounded qualitative approach - Codes

Codebook of design moves

Move	Definition	Examples from transcripts
Orient to task	Clarify and get information about the task and state perceptions of the AI tool	What do you mean? So we're attempting to redesign …
Find approach	Find approaches to working with AI	We can give it the prompt for what we want it to do [...] so now it will act as a UX/UI designer.
Prompt	Prompt or refine prompts to the AI	Can we ask, is the system useful to students?
Ideate	Brainstorm ideas independently or with AI	I feel like a progress tracking tool would be really good.
Review	Read and review AI's responses for their accuracy and helpfulness	I feel like it's actually everything I said. That's pretty cool.
Reflect	Reflect on the design space, drawing from personal experience or design feasibility.	It's nice to see as a student, a good tracking point.