

# Nathan Cloos

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## Education

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**MIT** PhD in Brain and Cognitive Science 2023–present  
with Ila Fiete on sample-efficient modular architectures

**UCLouvain** M.Sc., B.Sc. in Engineering (Applied Mathematics & Physics) 2017–2023  
with Frederic Crevecoeur (UCLouvain) & Robert Yang (MIT) on multi-system brain models

## Selected projects

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**Self-play LLM game generation** (collaboration with Phillip Isola at MIT CSAIL):  
self-improvement loop with [game generator](#) and [game player](#)  
fine-tuned 120B model with Tinker; awarded \$5k Tinker Research Program grant  
prelim results show generated games are increasingly challenging after training on 10k+ games

**Grok Play** (xAI hackathon 2025)  
built [Grok Play](#) in 24 hours and won 1<sup>st</sup> place at xAI hackathon (+500 participants)  
platform to compete against and with AI agents in games to improve LLMs' code generation

**LLM social reasoning** (MIT Sandbox):  
hackathon finalist awarded trip to MIT AI Conference in Palo Alto  
building 1M dynamic social environments to improve [LLMs' social reasoning](#), including theory of mind, negotiation and persuasion skills

**Baba Is AI** (ICML 2024 LLMs and Cognition Workshop):  
built [environments](#) for grounded reasoning based on the game Baba Is You  
evaluated LLMs at playing the games from text+image inputs

## Employment

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**Microsoft Research intern** Summer 2025  
built 120 game dev and game testing tasks to benchmark tool-use coding agents including Claude Code, GitHub Copilot, Codex  
deployed it to Microsoft Azure's infrastructure with distributed and containerized execution

**Technion** research assistant in Omri Barak's lab 2022–2023  
mechanistic interpretability study of RNNs trained on neuro-inspired tasks

**MIT** research assistant in Robert Yang's lab 2021–2022  
built a [framework](#) that standardizes and compares over 207 representational similarity metrics from 32 papers

**Ficos S.A.** software engineer Summers 2018–2019  
developed ERP and tracking software for customers in the construction sector

## Publications

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[Differentiable optimization of similarity scores between models and brains](#)  
**Nathan Cloos**, Moufan Li, Markus Siegel, Scott L. Brincat, Earl K. Miller, Guangyu Robert Yang, Christopher J. Cueva.

**oral presentation:** Cosyne 2024 ICBINB Workshop, CCN 2024. poster: ICLR 2025

[A Framework for Standardizing Similarity Measures in a Rapidly Evolving Field](#)

**Nathan Cloos**, Guangyu Robert Yang, Christopher J. Cueva

**oral presentation:** Neurips 2024 UniReps Workshop

[Automating and Validating Agent and Environment Code Generation with Large Language Models](#)

**Nathan Cloos**, M Ganesh Kumar, Adam Manoogian, Christopher J Cueva, Shawn A. Rhoads

poster presentation: Neurips 2024 Behavioral ML Workshop

[Baba Is AI: Break the Rules to Beat the Benchmark](#)

**Nathan Cloos**, Meagan Jens, Michelangelo Naim, Yen-Ling Kuo, Ignacio Cases, Andrei Barbu, Christopher J Cueva

poster presentation: ICML 2024 LLMs and Cognition Workshop

[Scaling up the Evaluation of Recurrent Neural Network Models for Cognitive Neuroscience](#)

**Nathan Cloos**, Moufan Li, Guangyu Robert Yang, Christopher J. Cueva

poster presentation: Cosyne 2022, CCN 2022, Bernstein 2022

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## Awards

2025: MIT Eugene Stark Fellowship

2025: MIT Envisioning the Future of Computing Prize

2024: MIT Henry E. Singleton Fellowship

2023: B.A.E.F. Honorary Fellowship

2021: UCLouvain Lhoist Berghmans Chair Scholarship

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## Miscellaneous

designed and built a [can-sized satellite](#) that won the national CanSat Belgium competition, organized by the European Space Agency, and competed in the European finals