
Cognisyn
A Simulator for AI Scientists of All Ages to Explore the Continuum of Natural & Artificial Intelligence
Tish Shute, Founder

The Cognisyn Simulation Framework

Exploring Diverse Forms of Cognition, Life, Mind, Agency, Consciousness, Generalization, and Relevancy

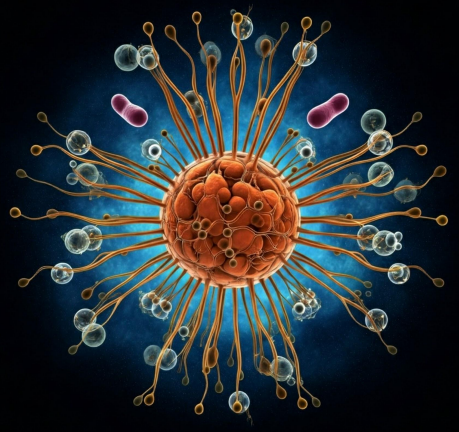
A multiscale, multiagent, complex learning framework for self-learning, self-organizing agents inspired by TAME (Levin 2022).

Emulating a computational model of life to explore agency, mind, and intelligence.

The Cognisyn framework uses dynamic memory - the ability to rewrite and remap information (.e.g memories) onto new media and new contexts for an agent to reinterpret and modify itself based on the simulation/gym environment.

Quantum entanglement is leveraged for multiagent, multiscale communication.

Cognisyn: Intelligence That Cares



Current AI models fail to generalize to novel situations and are not self aware.

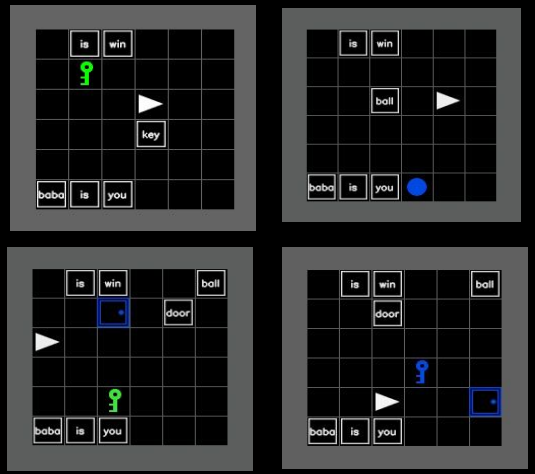
Taking on “hard problems” of Consciousness, Agency, Self Awareness, Generalization, Relevancy, and Care.

Enabling a New Generation of AI Scientists To Explore the Most Important Science of Our Time

Cognisyn Plays Baba Is Alive!

Cognisyn demonstrates dynamic generalization abilities and agency through a new game/benchmark/gym “Baba is Alive” - an evolution of the unbeaten dynamic benchmark for systematic compositionality “Baba is AI” based on the popular puzzle game, “Baba Is You.”

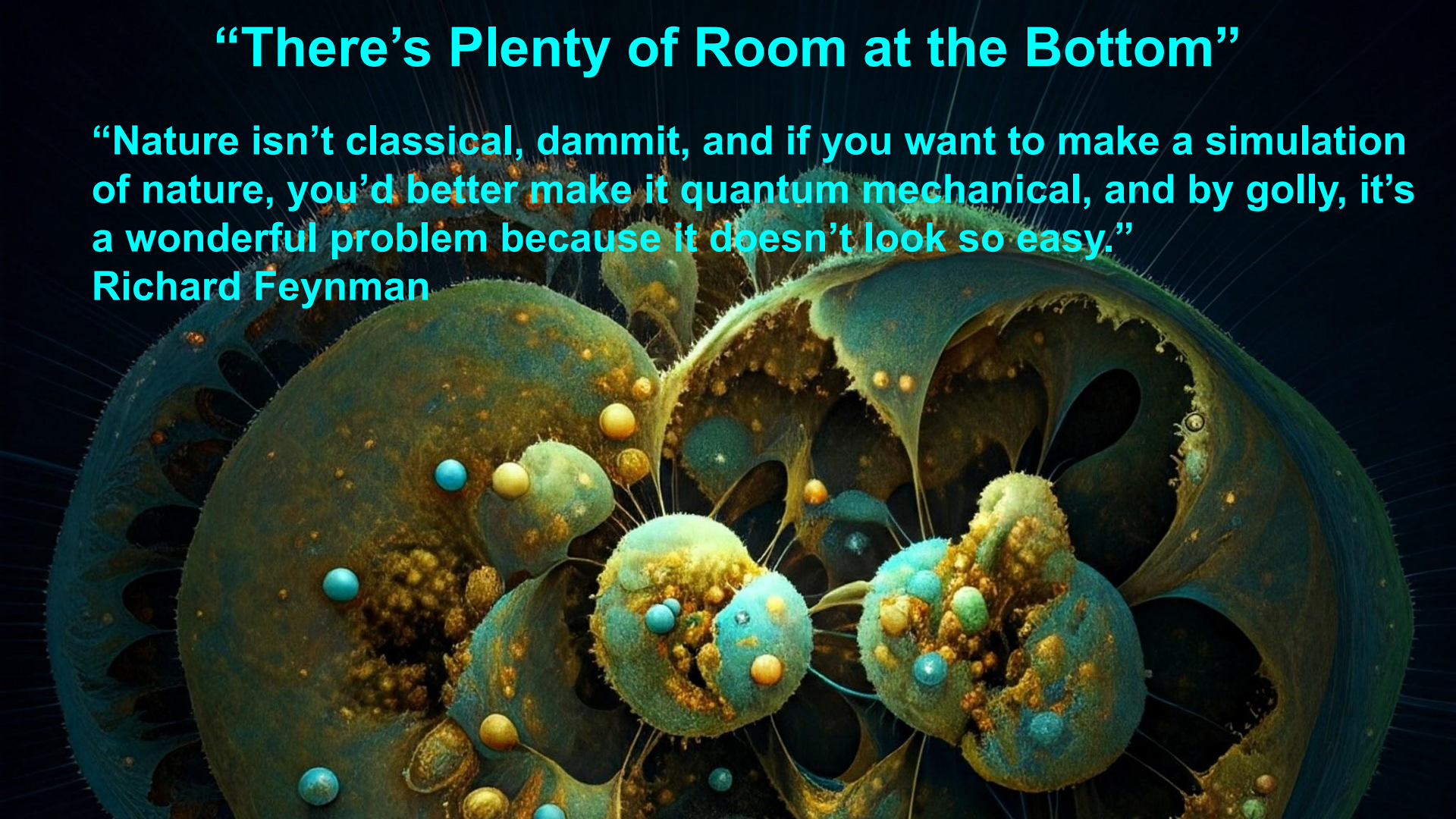
Baba is You, a puzzle game centered on the manipulation of rules.



A set of dynamic generalization tasks define the Baba gym/ benchmark environment.

“There’s Plenty of Room at the Bottom”

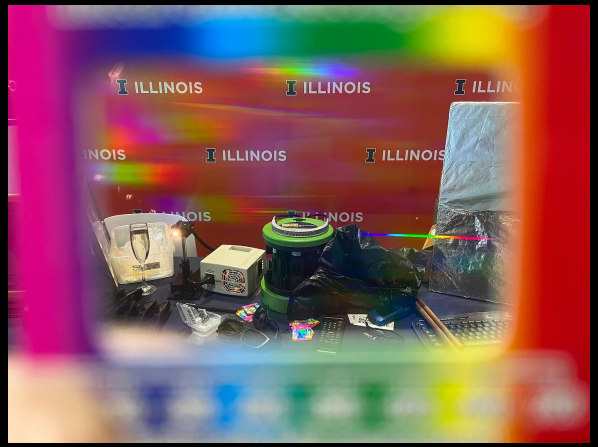
“Nature isn’t classical, dammit, and if you want to make a simulation of nature, you’d better make it quantum mechanical, and by golly, it’s a wonderful problem because it doesn’t look so easy.”
Richard Feynman



“Hard” Problems Are Getting Less Hard

Quantum science tools and open communities are supporting a new generation of quantum scientists.

CUDA-Q, Quiskit, Cirq, PennyLane, Amazon Braket, ProjectQ, Microsoft Azure Quantum, Google Quantum AI, D-Wave Leap.



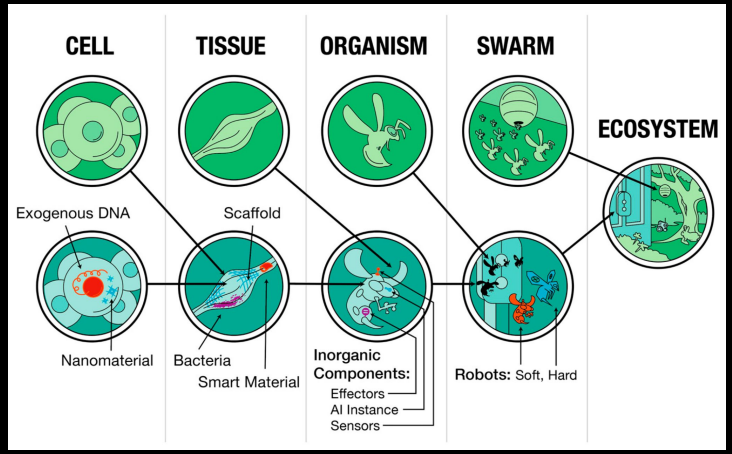
“From Artsy Kid to Quantum Scientist: The Power of Creativity in Quantum”

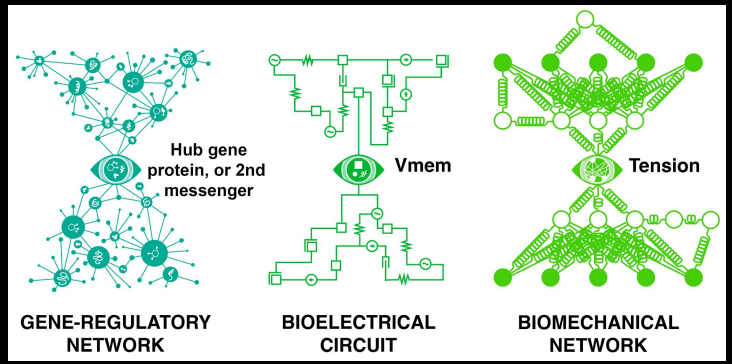
https://medium.com/qiskit/from-artsy-kid-to-quantum-scientist-the-power-of-creativity-in-quantum-9e8e71272d7d

Technological Approach to Mind Everywhere (TAME)

"TAME is a framework for understanding, and learning to manipulate, the robust functional capabilities of multiscale agents (whether evolved, designed, or hybrid). RL promises to be its mathematical instantiation. However, RL as it stands today, misses a few of TAME's attributes– in particular, its emphasis on the multi-agent setups that are common in biology. As such, these attributes promise to deliver new questions in reinforcement learning."
Dr Michael Levin
https://gwern.net/doc/reinforcement-learning/multi-agent/2024-seifert.pdf

Cognisyn's Architecture is inspired by TAME, Dr Michael Levin, and David Silver's work on Reinforcement Learning.





The Future of Intelligence is on a Continuum of Natural and Artificial Intelligence

"We are going to see the merger of biology and digital technology. Biology is too slow, and AI is too stupid. We need to combine the two to make something truly powerful." Dr Michael Levin

Baba is Alive
Next: Introducing New Kinds of Tests for Agency

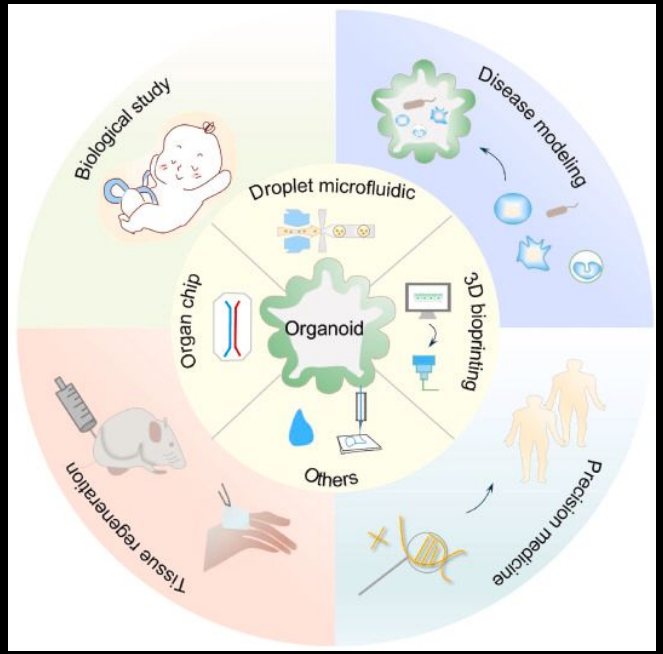
“We need to start thinking about intelligence in a much broader way. It's not just about IQ or the ability to do math. It's about the ability to adapt, to learn, to solve problems." Dr Michael Levin

Quantum Effects Detection

Promise and Risk

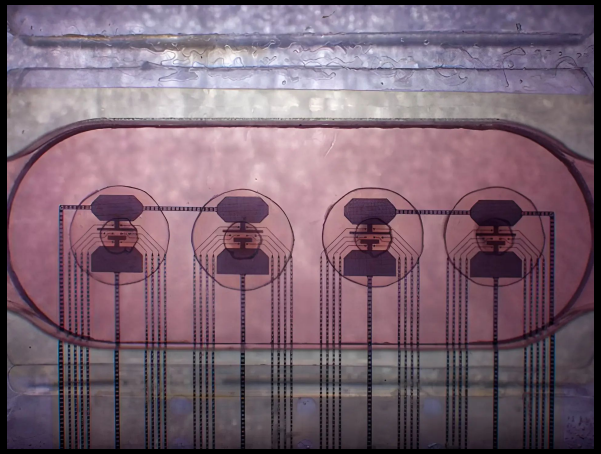
Solving Current AI Weaknesses:

- **Lack of Generalization:** AI models often struggle to apply knowledge learned in one context to new, unfamiliar situations.
- **Limited Self-Awareness:** AI lacks true self-awareness and understanding of its own actions and limitations.
- **Excessive energy consumption**

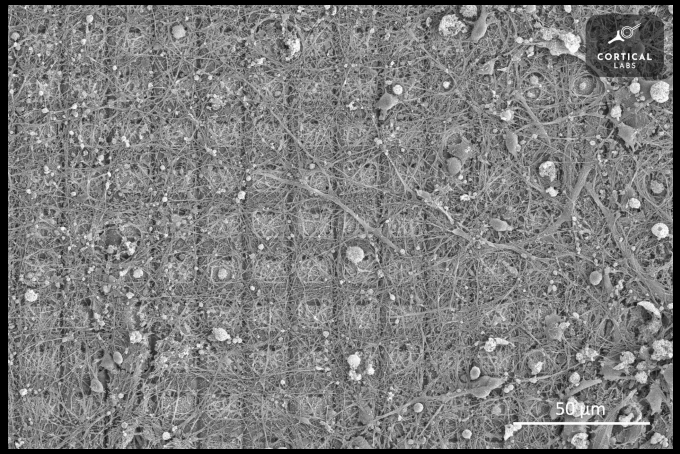


"We are going to see the rise of new forms of intelligence that we can't even imagine right now. We need to be prepared for that." Dr Michael Levin

Computer chip with built-in human brain tissue gets military funding



"Four human brain organoids, each with around 10,000 living human brain cells, wired into a biocomputing array in FinalSpark' s Neuroplatform," FinalSpark



"A scanning electron microscope image of DishBrain neurons growing on an array of electrodes ."
Cortical Labs

'Brain-in-a-jar' biocomputers can now learn to control robots

https://newatlas.com/computers/human-brain-chip-ai/?itm_source=newatlas&itm_medium=article-body
https://newatlas.com/robotics/brain-organoid-robot/

AI Competition and War

https://80000hours.org/podcast/episodes/sihao-huang-china-ai-capabilities/

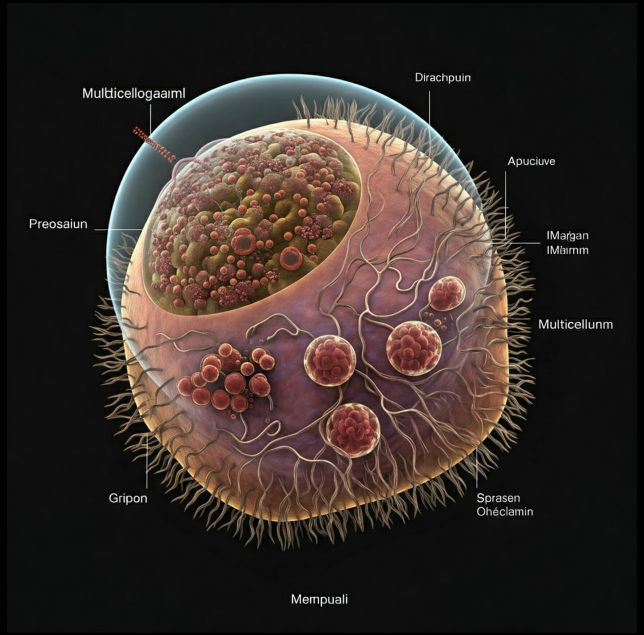
Care is a Vital Concept for Intelligence

Levin demonstrates the concept of 'Care' as the central invariant to the emergence of intelligence.

"Care as the capacity to exert energy and effort towards preferred states."

"Care as a central concept in biology (ubiquity of homeostatic loops at various scales of organization of life)."

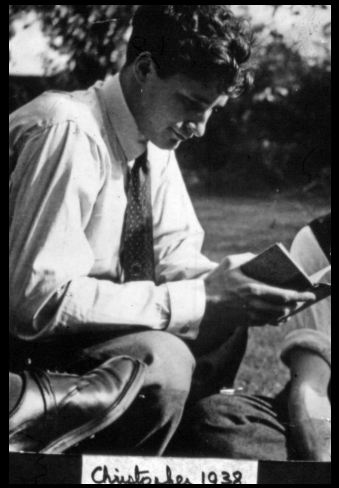
"Care with respect to other agents goals and progress in synthetic and natural evolution and in AI" (Levin, 2022).



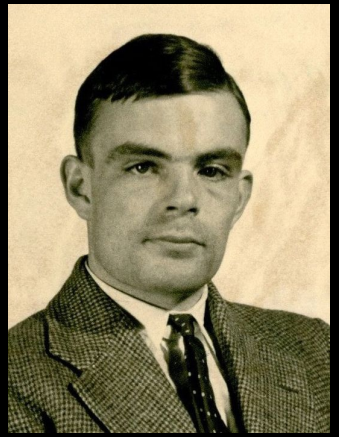
Warning: Addiction to greed, power, and violence will disrupt homeostasis and care.

Remembering
Prejudice & Violence Faced by AI Pioneers

Charles Shute, Mathematics, King's College Cambridge, 1936. Charles traveled to Mussolini's Italy, Summer, 1938, with a male friend. They feared for their lives.



Christopher Strachey, Mathematics, King's College, Cambridge, 1935, "where he suffered a nervous breakdown during his third year (which his sister attributed to his struggles to come to terms with his homosexuality)."



Alan Turing, Mathematics, King's College, Cambridge, 1931, "Despite his pivotal part in ensuring the safety of the nation and saving countless lives, his sexuality resulted in him being defined as a security risk," Alan Turing was chemically castrated and harassed by police surveillance up until his untimely death in 1954, at 41.

The Importance of Open Communities and Open Dialogue for AI Science and Ethics

Ludwig Wiggenstein - The Moral Sciences Club
Lectures on Foundations of Mathematics, Cambridge University

Alan Turing: “From the mathematical theory one can make predictions”
Ludwig Wittgenstein: “Yes, one can. But what sort of predictions? What is the relation between the mathematics and the predictions?”

California Institute for Machine Consciousness

https://cimc.ai/

Joscha Bach

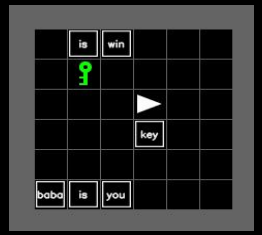
https://www.psychologytoday.com/intl/articles/201809/the-wizard-consciousness

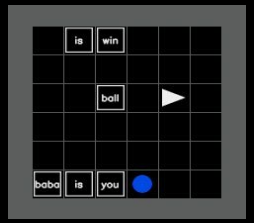
"Understanding the mind is the most important project in the history of philosophy. The development of powerful, generally intelligent agents—driven by economic, cultural, and military incentives—appears inevitable. Attempting to control highly advanced agentic systems far more powerful than ourselves is unlikely to succeed. Our only viable path may be to create AIs that are conscious, enabling them to understand and share common ground with us." Joscha Bach

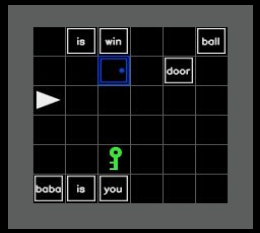
Cognisyn
A Simulator to Explore New Definitions of Consciousness, Mind, Agency, and Intelligence

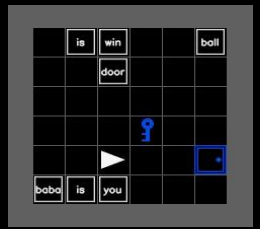
“Some people think that a simulation can’t be conscious and only a physical system can. But they got it completely backward: a physical system cannot be conscious. Only a simulation can be conscious. Consciousness is a simulated property of the simulated self.”
— **Joscha Bach**

Video of Demo
Cognisyn Plays Baba Is Alive!









Team

Tish Shute is a polymath with deep experience in AI, ML, multi-agent systems, simulations, game theory, spatial computing, research & development, leadership, entrepreneurship, and innovation.
https://www.linkedin.com/in/tishshute/

Otto Leichliter is a puzzle solver, math modeler, AI/ML Developer, Sr. Dev Ops and Automation Engineer, excelling not only in development of machine learning/AI solutions but also in algorithm design, multi-agent systems design, self organizing, self evolving LLMs and automation.
https://www.linkedin.com/in/ottoleichliter/

Anselm Hook works on computation to help us navigate the future better together, collaborating with designers, scientists, artists, engineers, programmers, and funders from all over the world, often on tight timeframes, nurturing many teams and developers, and putting rich interactive experiences in front of millions of people.
https://www.linkedin.com/in/anselm/

Two Generations of Polymathy and AI Science

Tish Shute 2024

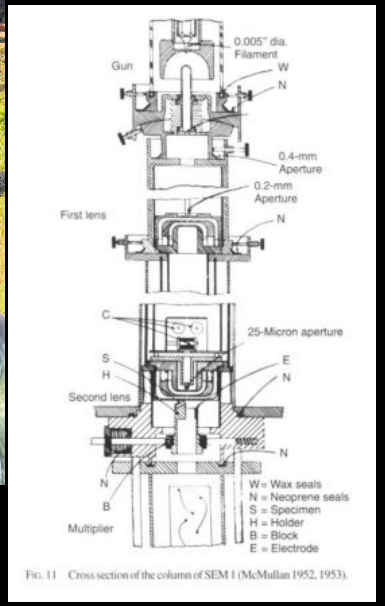
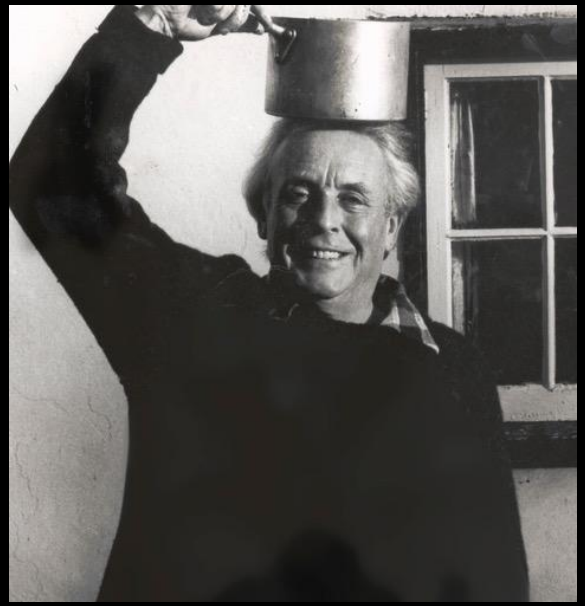
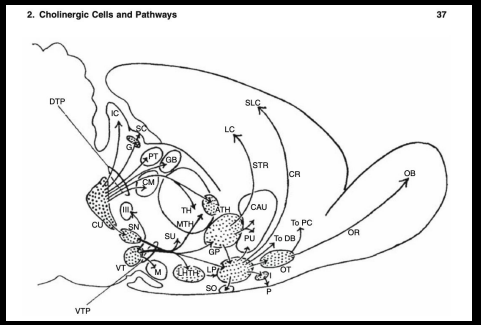


Fig. 11 Cross section of the column of SEM 1 (McMullan 1952, 1953).





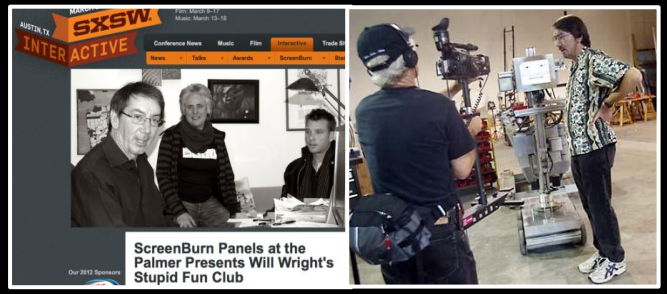
"The Ascending Cholinergic Reticular System: Neocortical, Olfactory and Subcortical Projection" by C.C.D. Shute and P.R. Lewis

Professor C.C.D Shute, Histology, Cambridge University, 1917 - 1999

Histology - the study of the microscopic structure of tissues and organs), My father was one of the first people in the world to use an electron microscope to trace the neural circuits of the brain because he wanted to explore how the brain sees color.

A Life in AI Science and Technology

Creating Visual Effects for Film & Television and a Synthetic Co-ordinate System for The Elicon. 6DOF Motion Control Robot. In 1991, my first start up, NPlusOne's real time software for motion control cameras and optical printers was acquired by Disney Imagineering via Ass. & Ferren. On the right, working on the Interpreter with Sidney Pollack.

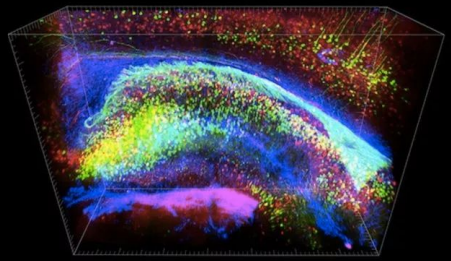


Worked with Will Wright (creator of The Sims, the best selling PC Game franchise in history) at Stupid Fun Club creating next generation entertainment - smart toys, social robots, and augmented reality television and games.

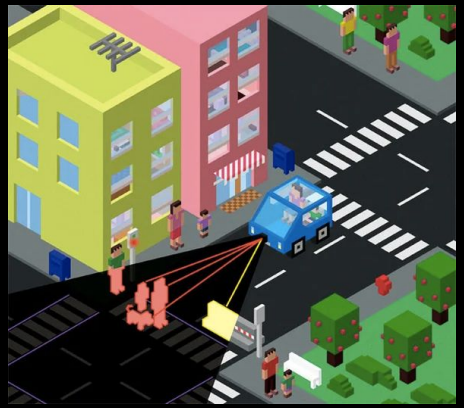
Co-Founded Augmented World Expo 2009. More than 6,000 attendees, 300 exhibitors, and 575 speakers convened to celebrate the 15th anniversary of AWE in 2024.

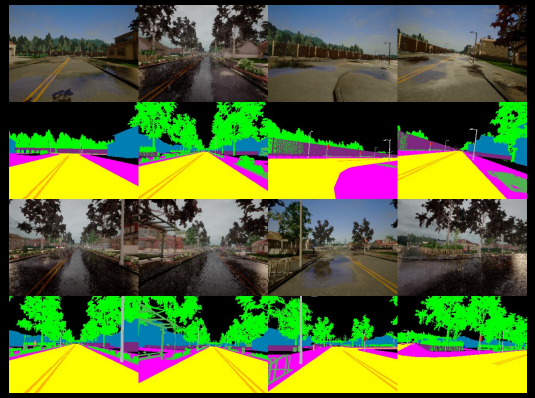
Founding team of Syntertainment with Will Wright, created MVP for a new generation of mobile, social simulation games based on innovative approaches to AI & machine learning.

Solving Hard Problems of Machine Perception and Merging Light and Data Communications



The Photonic Brain





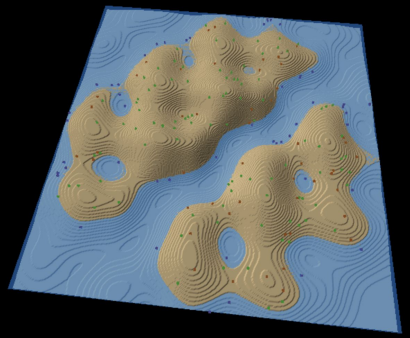
The Photonic City

Orbital with Anselm Hook - Agents that Share Work

The Earth is more than just a home it is a living system and we are part of it -- James Lovelock, The Gaia Hypothesis

Orbital is an experimental framework for creating many agent simulations.

Share and explore topics such as the behavior of coastal fishing communities or urban traffic congestion or other social simulations, digital twins or even games.



Orbital is open-source and you can deploy Orbital projects on a web server such as by using github pages. An easy-to-edit declarative 'manifest' notation lets you describe scenarios in ordinary text.

The philosophy behind Orbital is informed by systems designers such as Alan Kay, Bret Victor and others - there's an emphasis on fun social co-development.

Introducing the Cognisyn Simulator

Thank You Nvidia Inception and AWS for cloud credits to create the Cognisyn Plays Baba is Alive Demo!