



7PM

12AM in London (GMT), 9AM in Tokyo (GMT+9)

Panel: Video Games and Intelligence

Moderator: Andreas Bueckle, *Indiana University*

Panelists:

- Ted Castronova & Ivica Ico Bukvic, *Indiana University*
- Chabane Maldi, **Tutemic**, *Dallas, Texas*





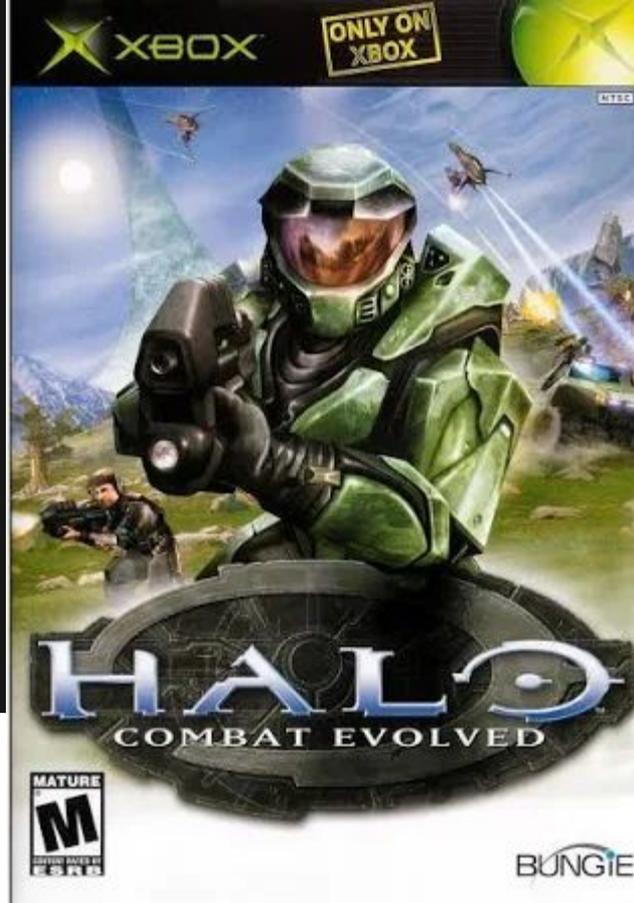
The enemy AI of the original *Halo: Combat Evolved* was hailed for its brilliance, coded to be believable.

Specific enemies have **unique behaviors** and **nuances** that, even as they become familiar and predictable, are never mundane enough to cause encounters to feel the repetitive. When the player knows what each enemy can and may do, they will frequently make micro-decisions and short-term strategies to meet the opposing force.



<https://www.cbr.com/halo-enemy-ai-best>

Released in 2001





Grunts



Elites



Jackals



Hunters



<- Master Chief (you!)



REDFALL

Redfall Review

Fangs, but no fangs.

The key word here is quickly, though. **That is, you have to kill them before the AI gets the opportunity to embarrass itself.** The longer combat drags on, the more evident it is that Redfall's enemies completely lack the wits to put up a stimulating fight.

Redfall's enemies completely lack the wits to put up a stimulating fight.

Human enemies seem largely disinterested with taking effective cover in a shootout. This is particularly evident if you ever sit back and watch the various factions battle one another; opposing soldiers love squatting *in front* of objects to give their assailants the best chance to kill them. I've had snipers rushing at me like an eight-year-old on their first visit to laser tag, and others who've found themselves irrevocably trapped inside parts of the environment.

<https://www.ign.com/articles/redfall-review>

Released in 2023



Shadow of Mordor is worth revisiting for the **nemesis system** alone

The part of Shadow of Mordor that's barely aged is its **nemesis system**. Its method of **creating and preying upon grudges** became its defining feature when it launched and for good reason. The nemesis system still kills.



<https://www.pcgamer.com/games/action/shadow-of-mordor-is-worth-revisiting-for-the-nemesis-system-alone/>

Released in 2014

XBOX 360



Trending: The Game Awards 2025: All the winners, everything announced | Best white elephant gifts

The [rise of AI NPCs](#) has felt like a looming threat for years, as if developers couldn't wait to dump human writers and offload NPC conversations to generative AI models. At CES 2025, NVIDIA made it plainly clear the technology was right around the corner. *PUBG* developer Krafton, for instance, [plans to use NVIDIA's ACE](#) (Avatar Cloud Engine) to power **AI companions, which will assist and banter with you during matches.** Krafton isn't just stopping there – it's also using ACE in its life simulation title *InZOI* to make characters smarter and generate objects.



Ted Castronova

Edward Castronova is a globally recognized expert in the economies of games and virtual worlds and a Professor of Media at Indiana University Bloomington. He invented the field of virtual economics in 2001 and has authored numerous books and papers on the subject. His consulting practice advises developers on the design of virtual economies and provides expert witness testimony on economic matters in the video game industry, representing both developers and players.

Castronova earned a BS from Georgetown University in 1985 and a PhD in Economics from the University of Wisconsin-Madison in 1992. He served as Assistant and then Associate Professor of Public Policy and Political Science at the University of Rochester (1992–2000) and as Associate Professor of Economics and Business at Cal State Fullerton (2000–2004) before joining Indiana University. In August 2025, he was appointed to the Indiana Commission on Higher Education to serve a two-year term as the faculty representative, a gubernatorial appointment to the state's highest-level administrative body for post-secondary education.

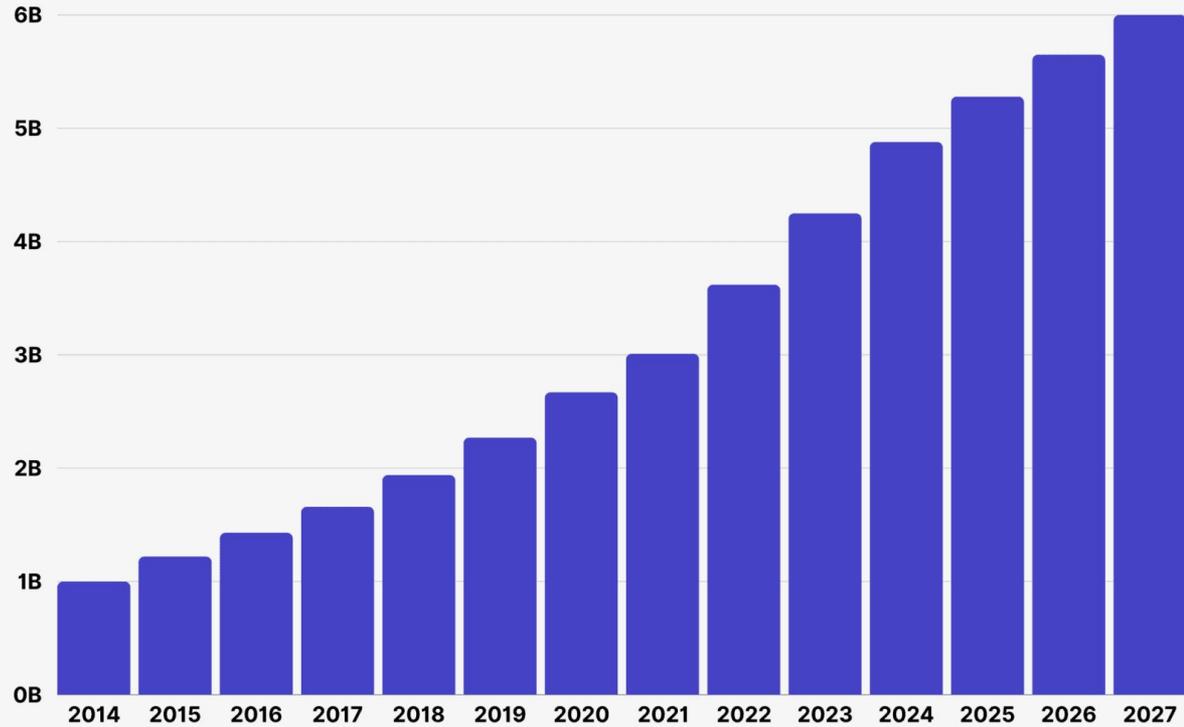




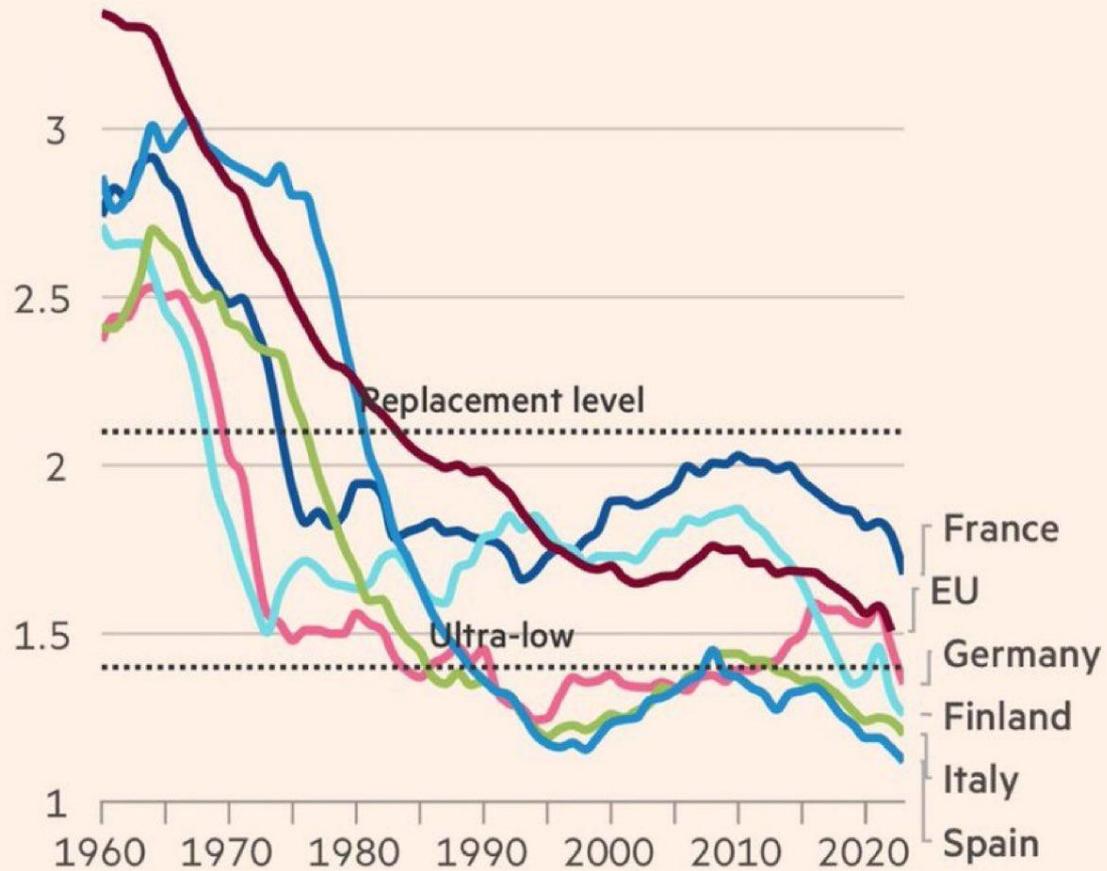


Number of Smartphone Users Worldwide

Smartphone Users Worldwide



Year









Ivica Ico Bukvic

Bukvic is a **post-disciplinary creative** exploring and building technologies for a better tomorrow. His current research trajectories consist of low-latency synchronous musical co-creation over distance, aural immersion and broadening of human cognitive bandwidth in automotive scenarios, large-scale digital signal processing, including spatialization, and data sonification, and enhancing K-12 education through integrated technology-mediated experiential learning. He believes in an integrative and holistic approach to creative scholarship, and a better future through culture and technology. Since 2010, Bukvic received over \$5.7M in external funding from industry and government agencies, including Google, Microsoft, National Science Foundation, NASA, and the Office of Naval Research (a part of US Department of Defense).



Bukvic received doctorate from the University of Cincinnati (2005) in composition and computer music. After having dedicated over 19 years to Virginia Tech, this August he joined **Indiana University as a professor in Media Arts and Production and the inaugural Director of the Kinetic Immersion and Extended Reality (KIX) Lab**, where I look forward to exploring novel approaches to digital storytelling and a study of human condition through technology. Areas of instruction include immersive audio and visuals, embodied interaction and game design, and their application in a broad array of scenarios, from health to entertainment, designed to improve the quality of life.

Prior to Indiana University, Bukvic served at Virginia Tech as the inaugural director of the Creativity + Innovation interdisciplinary initiative and the co-director of the Human Centered Design individualized interdisciplinary PhD program, a professor in Creative Technologies in Music in the College of Architecture, Arts, and Design's School of Performing Arts, the founder and director of the Digital Interactive Sound and Intermedia Studio (DISIS) and World's first Linux-based Laptop Orchestra (L2Ork), Institute for Creativity, Arts, and Technology (ICAT) Senior Fellow, and a member of the Center for Human-Computer Interaction (CHCI) with a courtesy appointment in the department of Computer Science.

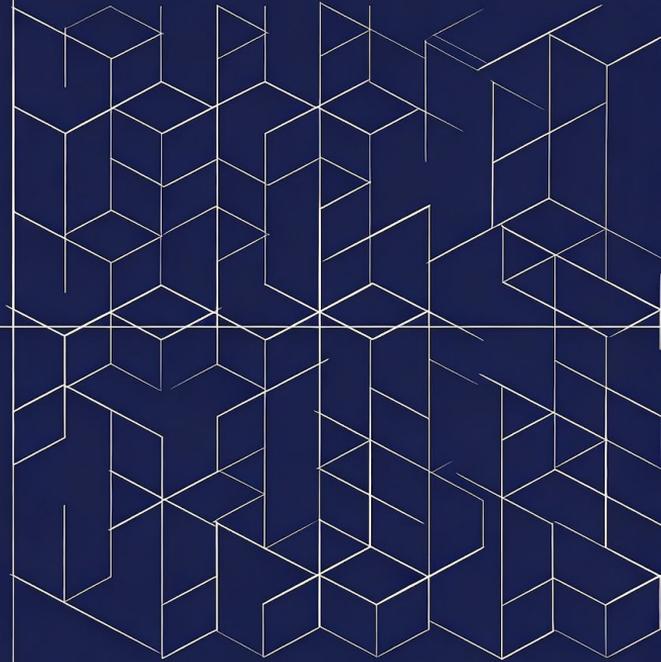
Chabane Maida



Chabane Maida is a **creative technologist, educator, and entrepreneur** driven by a passion for the intersection of creative media and systems thinking. He is the founder of **Whizshot**, a media company established in 2024 dedicated to researching and implementing novel creative media techniques. He previously lectured at Indiana University Bloomington's Luddy School of Informatics and Computing, **Information and Library Sciences**, and the Media School, where he oversaw the establishment of the **Game Lab** and technology for the university's new **Game Design** degree in 2015.

With a background rooted in early experimentation, such as code injection on the NES and filmmaking with a VHS camcorder in the 90s, Chabane has a special interest in cultivating the next generation of developers and tinkerers. He founded the successful Indiana University Game Development Camp and runs the popular educational YouTube channel, Tutemic. His work extends to industry applications, including developing the virtual training simulator for the Game Developers Conference (GDC) Conference Associates program. Beyond media, he is currently co-founding a clinic focused on care and research for childhood severe autism. A former president of the Islamic Center of Bloomington, he is a husband and father of four, currently relocating to Dallas.

Getting on the same page



Getting on the same page 1/2

The Perception of Popularity

Meaning of the term "AI" in gaming

Finite state machine

if player $x <$ enemy x , then enemy move left
if distance from player to enemy is less than aggro_distance, then enemy attack left

Navmesh

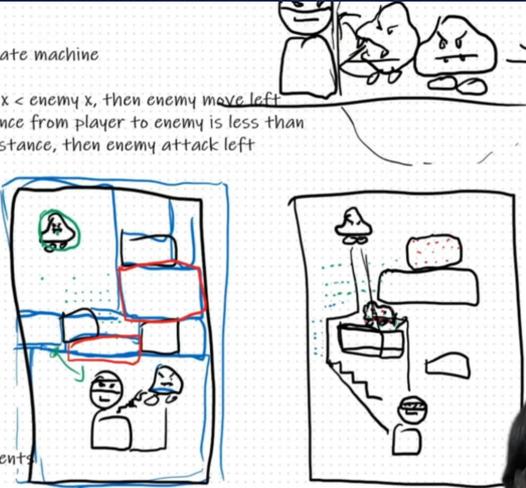
- easy to implement
- flexible
- tweak edge weights
- grid or voxel size

navmesh agents

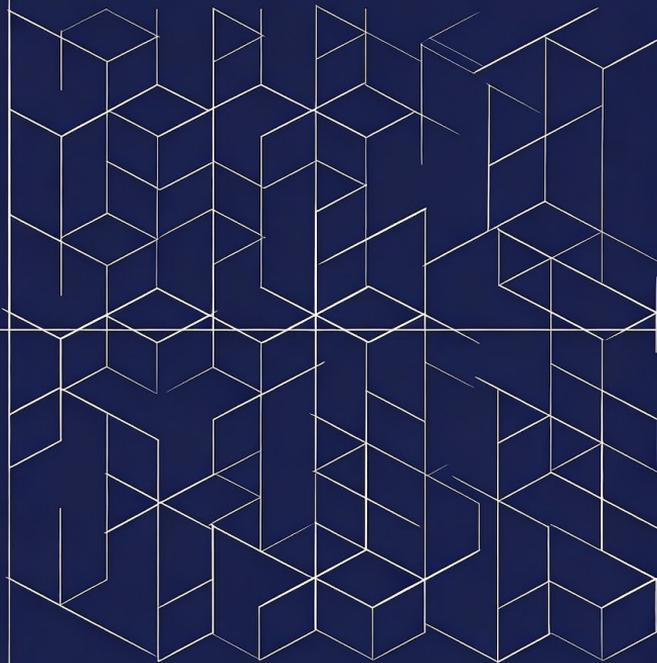
Graph search, graph

- breadth first search finds shortest path a queue data structure
- depth first search path finding finds memory. Is sometimes stack data structure
- Dijkstra's algorithm finds the shortest path. Can take

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TUTEMIC



Envisioning Intelligences

Getting on the same page 2/2

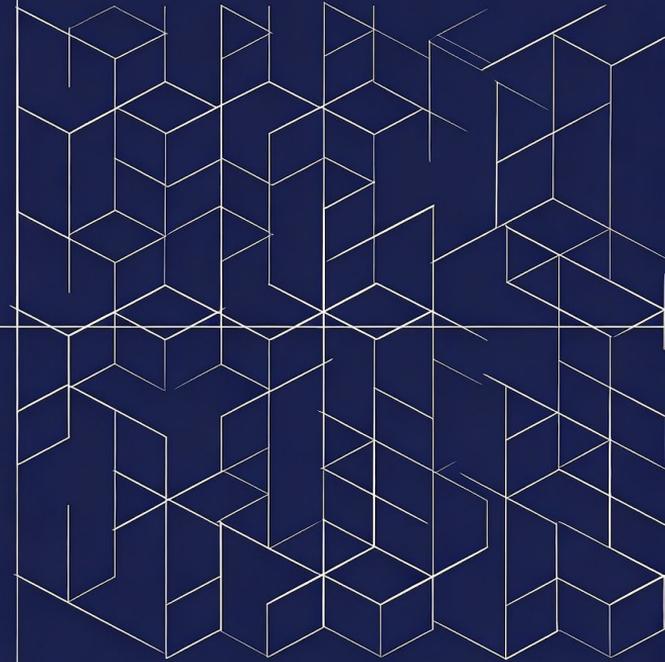
Generating prototypes



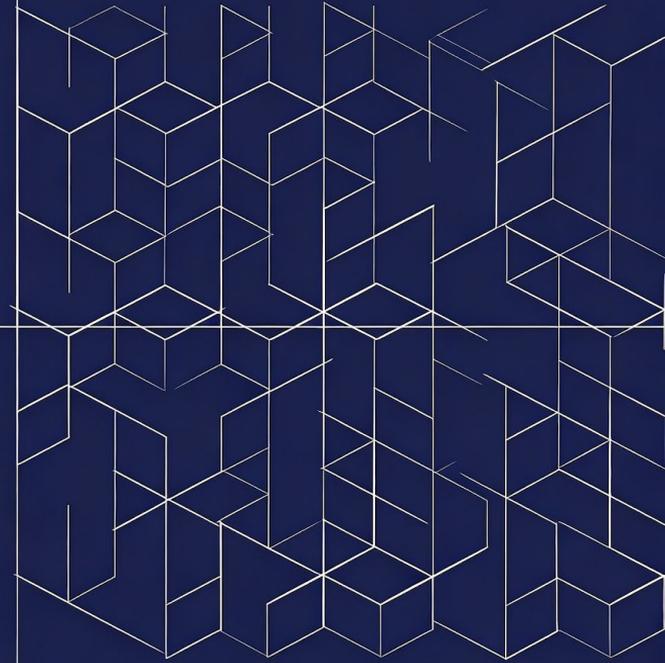
credit @mreflow, YouTube

Envisioning Intelligences

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Human tendencies



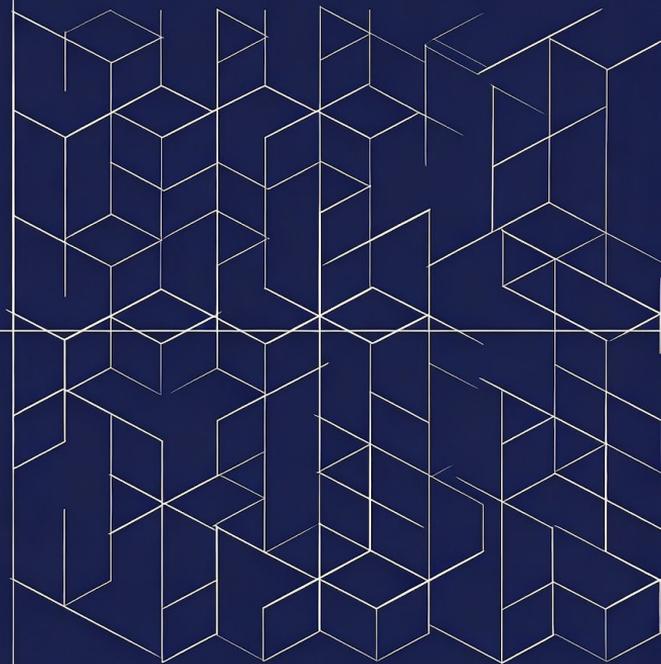
Envisioning Intelligences

Human tendencies 1/2

People like people



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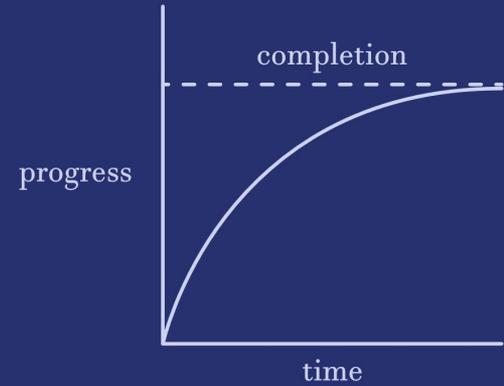
Envisioning Intelligences

Human tendencies 2/2

Lego mentality

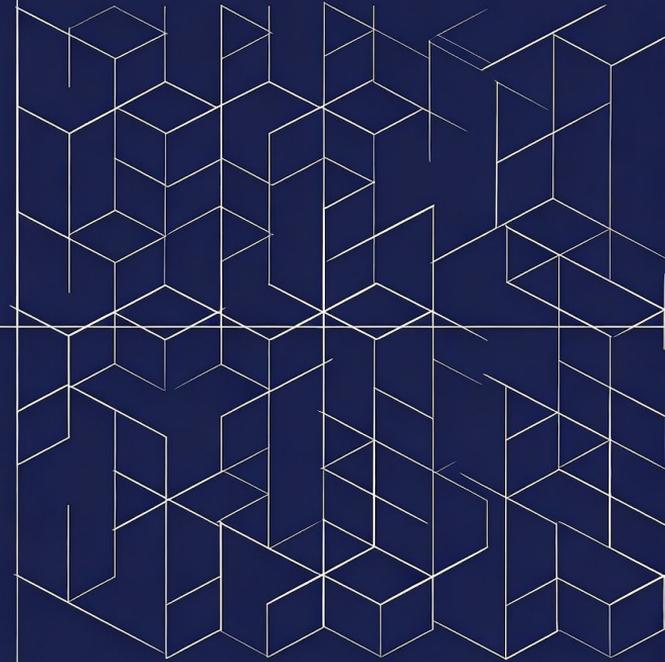


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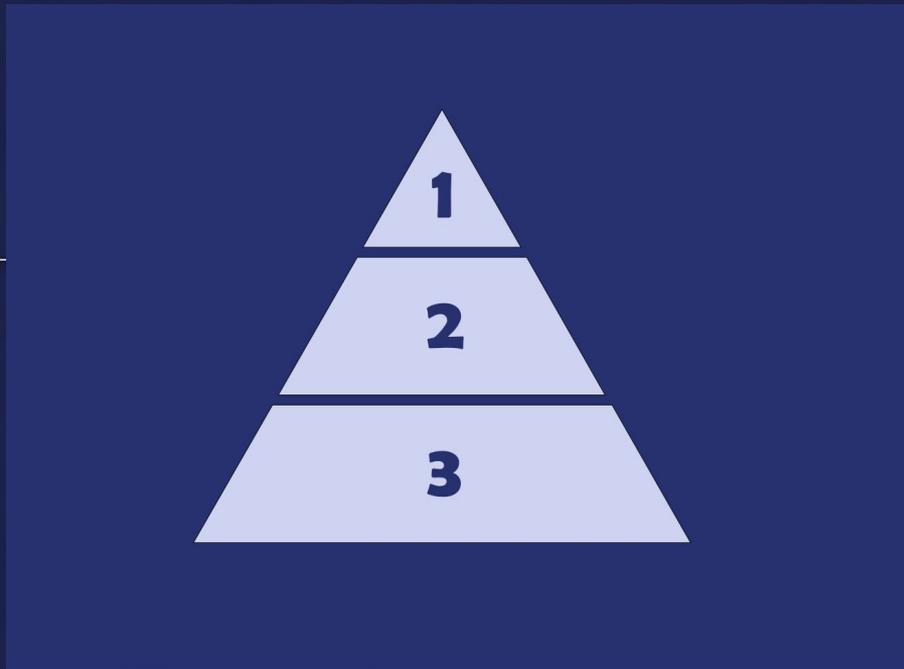
Creators and creatives



Envisioning Intelligences

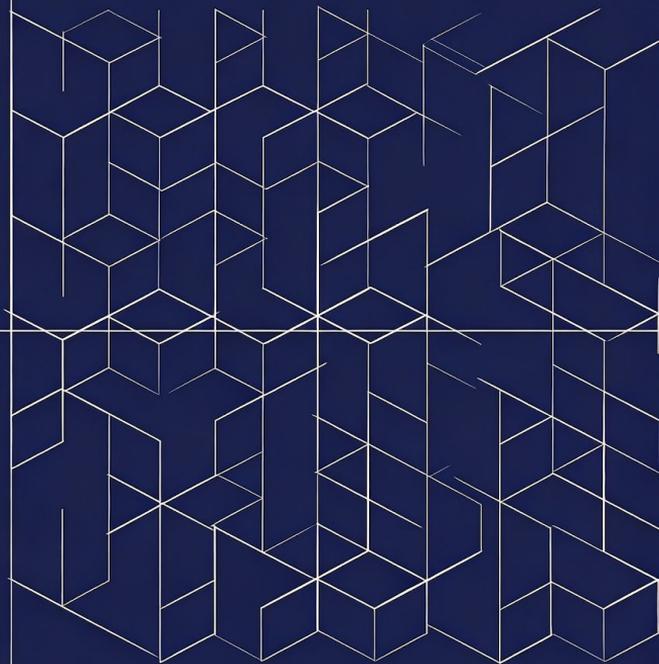
Creators and creatives 1/2

Pre generative AI



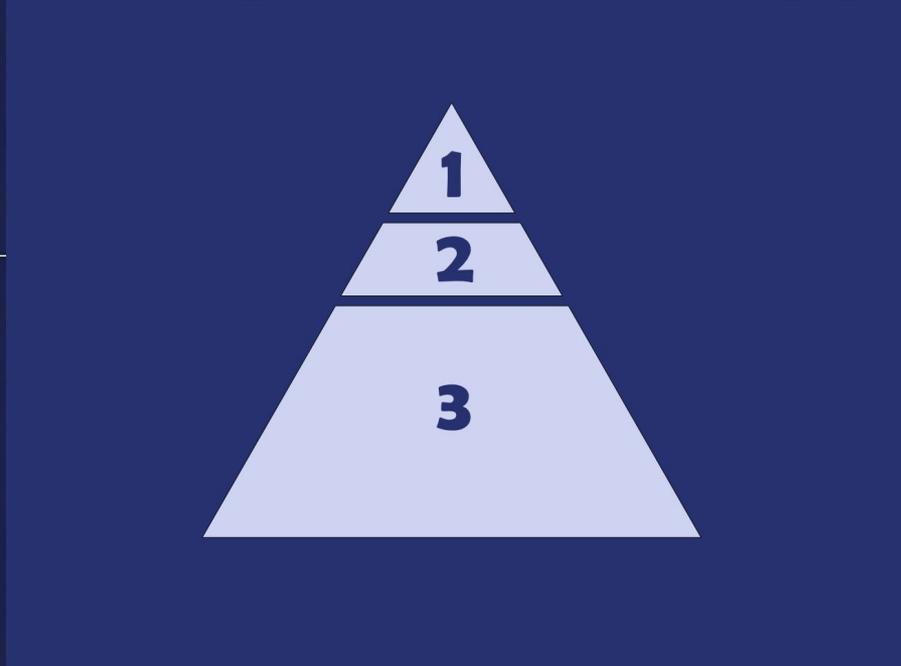
Envisioning Intelligences

The Perception of Popularity



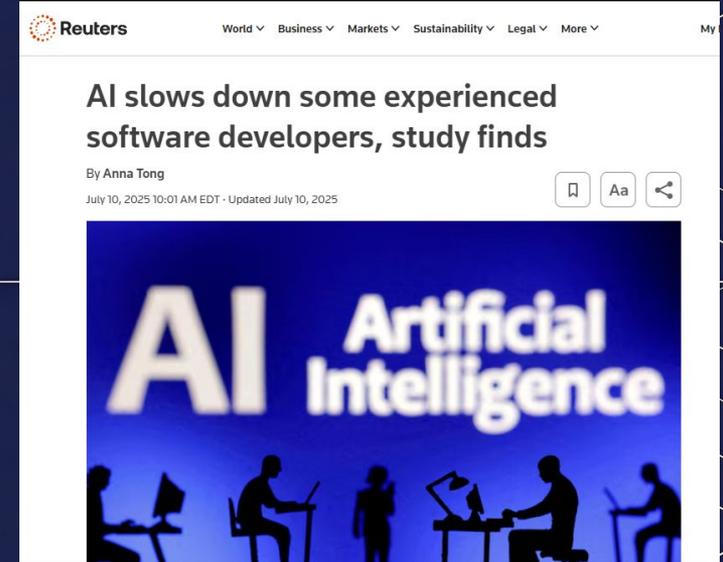
Creators and creatives 2/2

Transitioning to generative AI

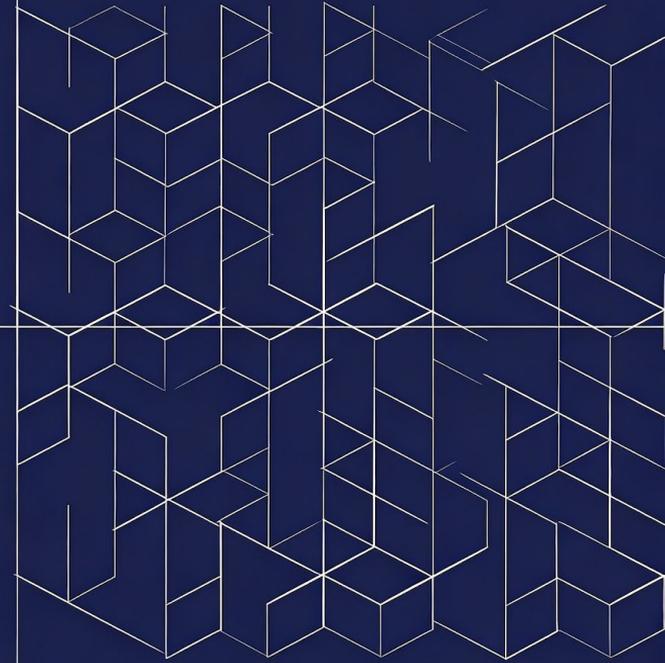


Envisioning Intelligences

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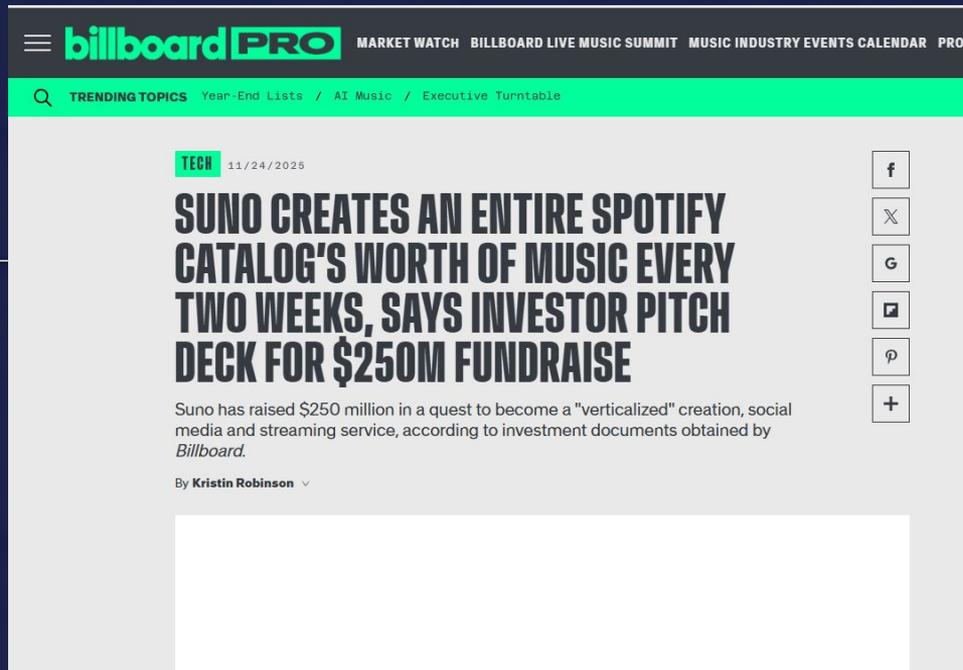


Impact and strategies



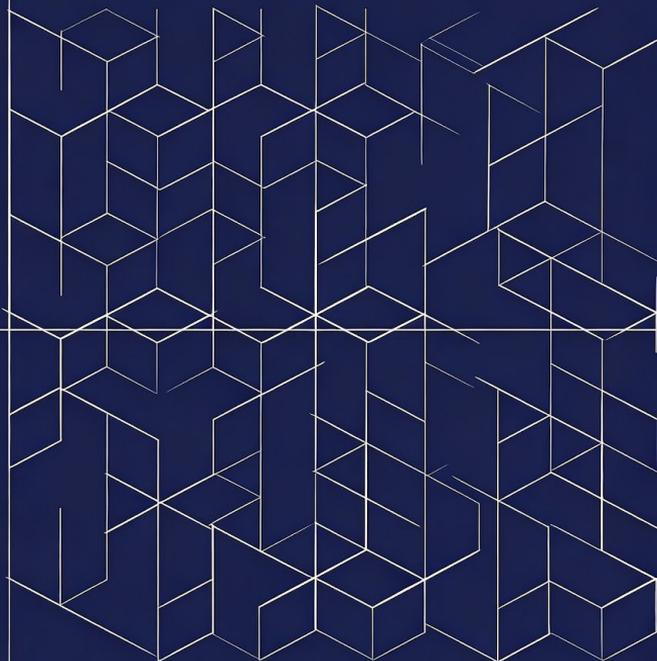
Impact and strategies 1/2

Too many games?



The screenshot shows a web page from Billboard Pro. At the top, there is a navigation bar with the Billboard Pro logo and links for 'MARKET WATCH', 'BILLBOARD LIVE MUSIC SUMMIT', 'MUSIC INDUSTRY EVENTS CALENDAR', and 'PRO'. Below this is a search bar and a 'TRENDING TOPICS' section with links for 'Year-End Lists', 'AI Music', and 'Executive Turntable'. The main article is titled 'SUNO CREATES AN ENTIRE SPOTIFY CATALOG'S WORTH OF MUSIC EVERY TWO WEEKS, SAYS INVESTOR PITCH DECK FOR \$250M FUNDRAISE'. It is dated 11/24/2025 and categorized under 'TECH'. The article text states: 'Suno has raised \$250 million in a quest to become a "verticalized" creation, social media and streaming service, according to investment documents obtained by *Billboard*.' The author is listed as 'By Kristin Robinson'. To the right of the article title is a vertical stack of social media sharing icons: Facebook, X, Google+, Email, Pinterest, and a plus sign for more options.

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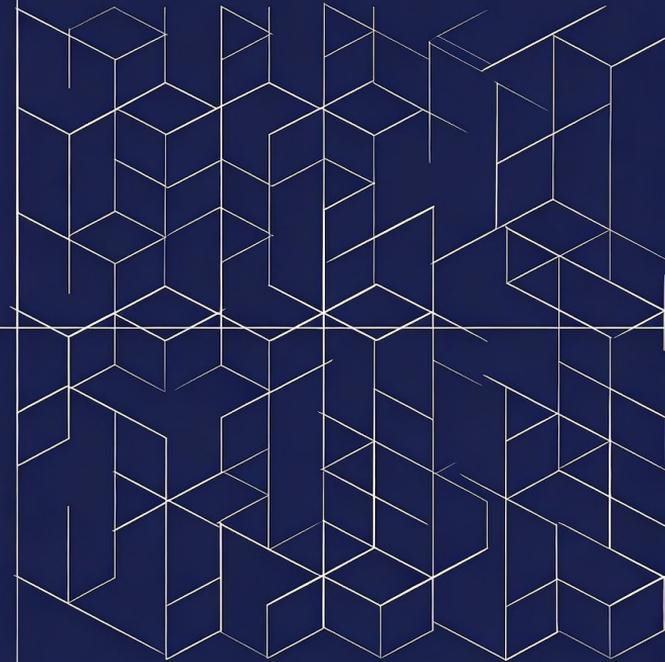
Envisioning Intelligences

Impact and strategies 2/2

New solutions to an old problem



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Envisioning Intelligences

Questions



- What translational insights can biomedical visualization experts learn from game designers when it comes to making 3D spaces and spatial data explorable?
- What was your last interaction with AI where you were surprised?
- What kinds of intelligences are present in video games?
- What traits and qualities does an intelligence need to be perceived as having agency by a player/user?
- Do we want game worlds to be populated by fully realized AI NPCs?
- How do you properly teach AI to game designers?
- Ted: John in Brave New World?
- Ico: Much AI is textual, visual. What does aural/sonic intelligence look like?
- Chabane: How will AI be integrated into the video game design process made in 10, 20, 30 years?
- How can we, as humans, use visualization to help the human understand how the other intelligence is thinking?

24h Envisioning Intelligences
event slides and video recordings:



Call for exhibit submissions:
<https://scimaps.org/call-for-submissions>

