

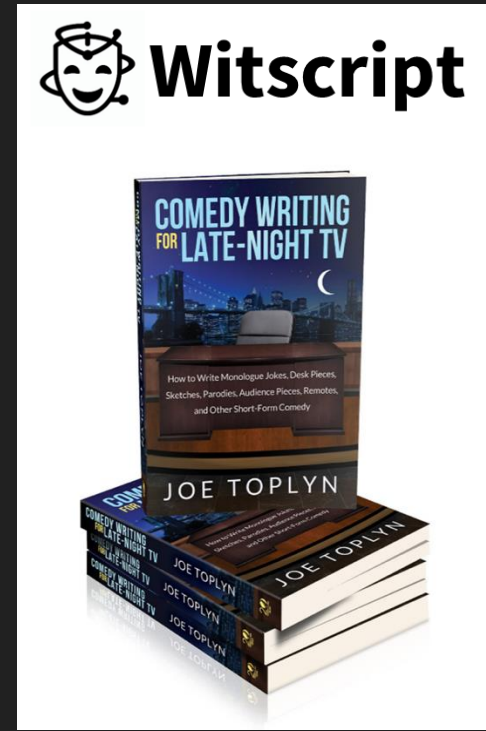
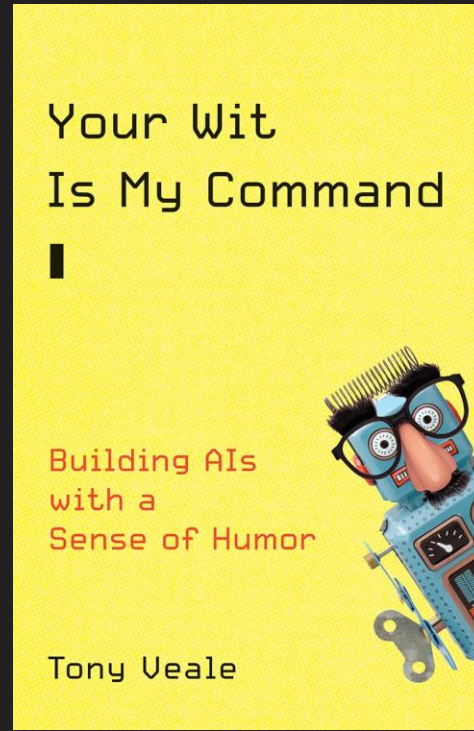
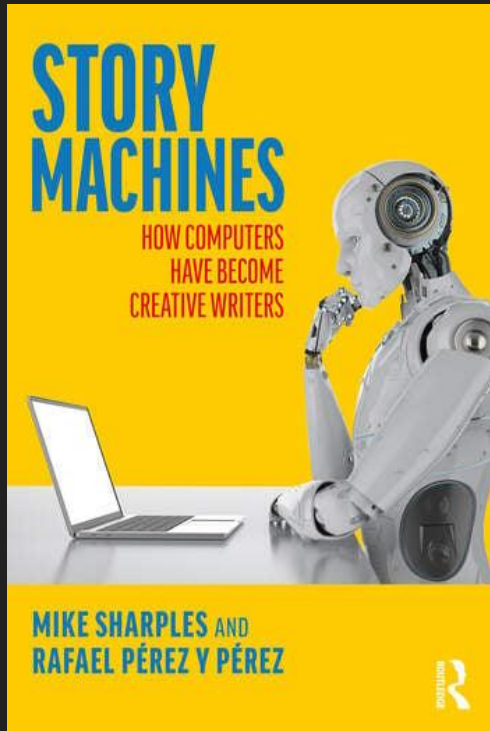
The Theater Stage as Laboratory: Review of Real-Time Comedy LLMs for Live Performance

Piotr Mirowski, Boyd Branch,
Kory Mathewson, improbabilities.org
Computational Humor 2025



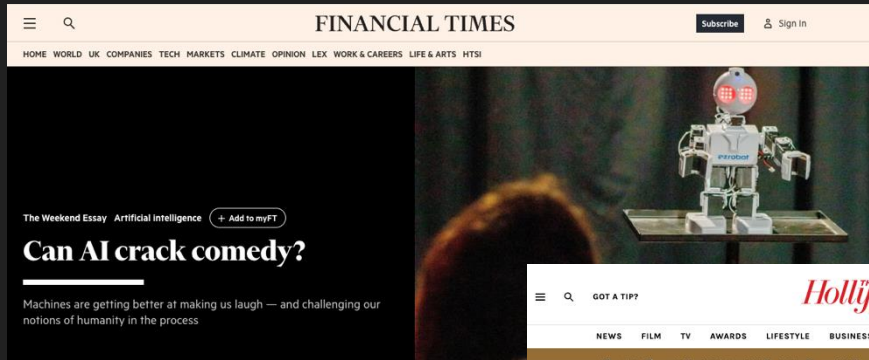
1. AI and comedy storytelling
2. Robot comedy as a test of humanity
3. Live performance and real-time interaction as a test for generative AI
4. AI language and human interpretation
5. Evaluation of live AI comedy

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Thomas Winters



Photos: Tank Magazine, TED, Georgia Tech



Mark Riedl and Lara Martin:
`improvisational storytelling
as a grand challenge for AI"

[Gorenz & Schwartz (2024) "How funny is ChatGPT? A comparison of human- and A.I.-produced jokes", PLoS One]

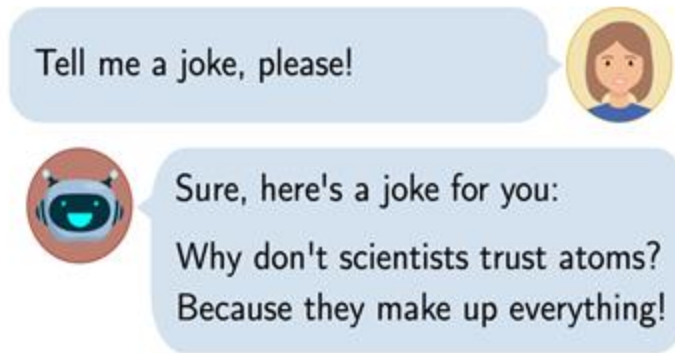
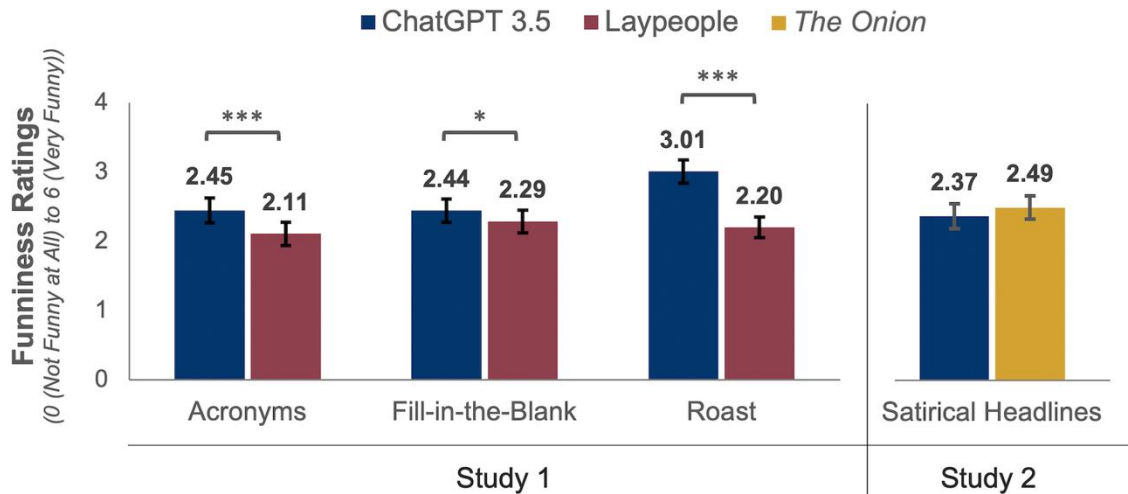


Figure 1: Exemplary illustration of a conversation between a human user and an artificial chatbot. The joke is a true response to the presented prompt by ChatGPT.



"Over 90% of 1008 [ChatGPT-]generated jokes were the same 25 jokes"

[Jentzsch & Kersting (2023) "ChatGPT is fun, but it is not funny! Humor is still challenging Large Language Models", arXiv]



“Artificial Intelligence Improvisation” by HumanMachine
The Miller Pub / Hoopla Improv Comedy Club
Photo (c) AnimoTV, RTE One
Extract from “Will a robot steal my job?”, aired in November 2017

Murder, she didn't write



“yes, and...”
always doing the
most obvious thing
“real time dynamic
problem solving”
(Brian Magerko)



Louis Armstrong / Library of Congress, Wikipedia

Showstoppers



Keith Johnston / The Spontaneity Shop



Viola Spolin / violaspolin.org

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Robot embodiment on the stage

"Sayonara" (2010)
Hiroshi Ishiguro, Oriza Hirata



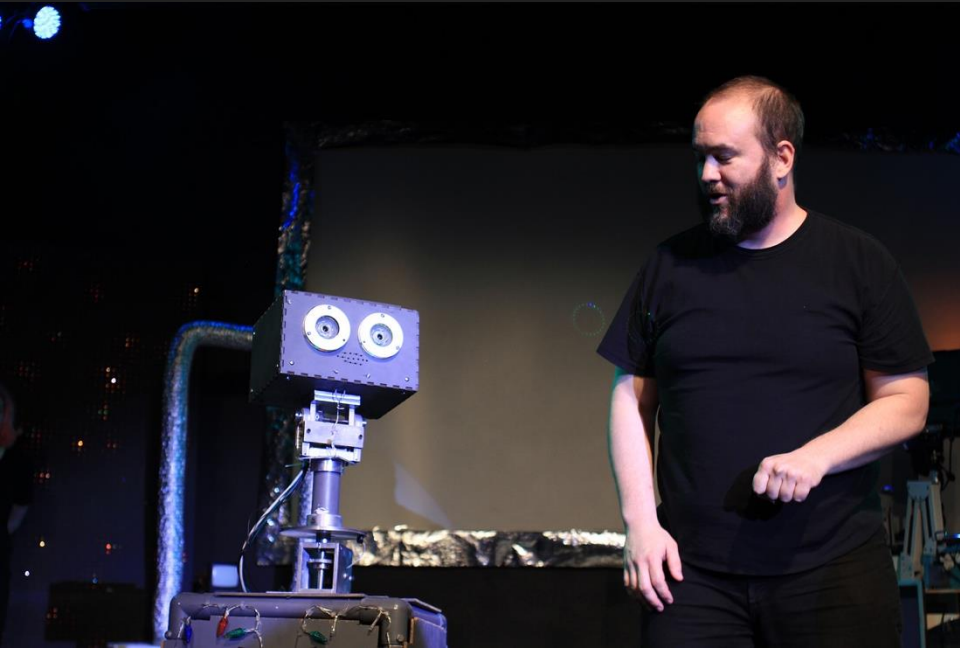
```
> typing, and talking-  
I am not a  
chatterbot.  
  
> typing, and talking-  
I am not a  
chatterbot.■
```

"Hello Hi There" (2010)
Annie Dorsen



"Judy" (2003)
Tom Sgouros

Can robots deliver comedy on stage?



[Heather Knight et al (2011) "A savvy robot standup comic: Online learning through audience tracking", TEI]
Photo: botparty.org / Wall Street Journal

Photo: Rapid Fire Theatre

Can robots deliver comedy on stage?



British Academy, 3 February 2017 / Photos: Matt Crossick

THE CAMPAIGN

[Home](#) / [The Campaign](#)

SUMMARY OF THE 2023 WGA MBA

5. Artificial Intelligence

We have established regulations for the use of artificial intelligence (“AI”) on MBA-covered projects in the following ways:

- AI can’t write or rewrite literary material, and AI-generated material will not be considered source material under the MBA, meaning that AI-generated material **can’t be used to undermine a writer’s credit or separated rights.**
- **A writer can choose to use AI when performing writing services,** if the company consents and provided that the writer follows applicable company policies, but the company can’t require the writer to use AI software (e.g., ChatGPT) when performing writing services.
- The Company must disclose to the writer if any materials given to the writer have been generated by AI or incorporate AI-generated material.
- The WGA reserves the **right to assert that exploitation of writers’ material to train AI is prohibited** by MBA or other law.

Computational humor presented as a competition between humans and AI

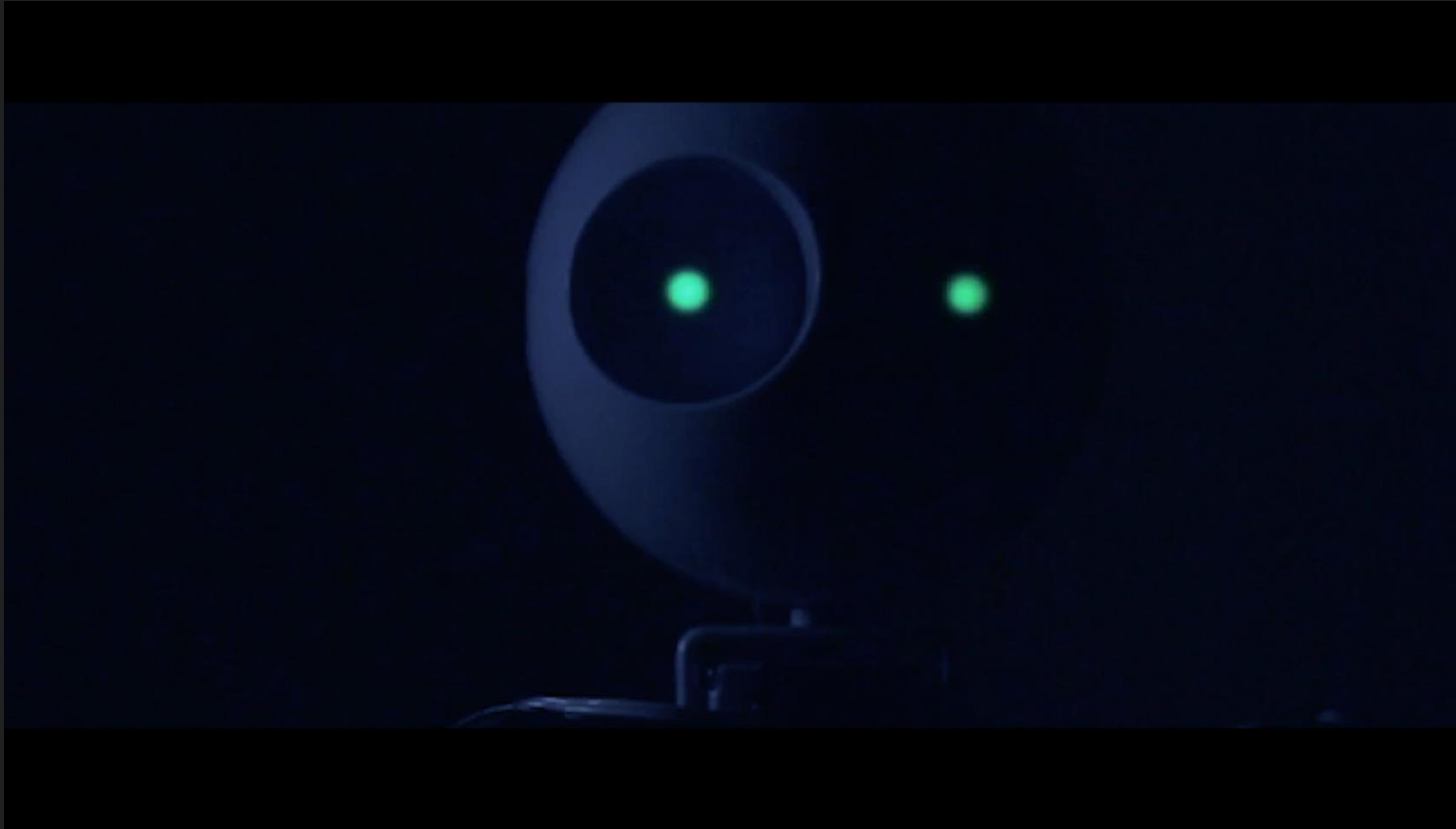


Allison Goldberg, Brad Einstein
Photo: Conner Linnerooth

Computational humor presented as a competition between humans and AI



Can AI pass the comedy Turing test?



Can AI pass the comedy Turing test?



Getting **suggestions** from the audience (2016-2017)



Improvising with large casts of **actors**, some **getting lines** from **chatbots** (2018-)



[Mathewson & Mirowski (2017) "Improvised Comedy as Turing Test", *NeurIPS AI Creativity*;
Mathewson & Mirowski (2018) "Improbots: Exploring the Imitation Game using Machine Intelligence in Improvised Theatre" *AIIDE*;
Loesel et al (2020) "Do Digital Agents Do Dada?" *ICCC*;
Branch et al (2021) "Collaborative Storytelling with Human Actors and AI Narrators", *ICCC*]

Comedic deception of audiences by AI



Feeling Machine / Friendly Fire
Manuel Hendry (2023)



Fake Show: Diffidate delle imitazioni / Rai (2023)

Comedic deception of audiences by AI

iPLAYER

Channels ▾

Categories ▾

A-Z

TV Guide



Edinburgh Unlocked

2024: Episode 2

1. AI and comedy storytelling
2. Robot comedy as a test of humanity
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1. Microphone for speech recognition
2. LLM-generated lines
3. Tablet for curating LLM lines
4. Radio receiver for text-to-speech
5. Earphone

AI co-creating real-time comedy dialogue



Improbabilities @ Gilded Ballon, Edinburgh Fringe,
17 August 2024 / Photo: Chloe Elizabeth



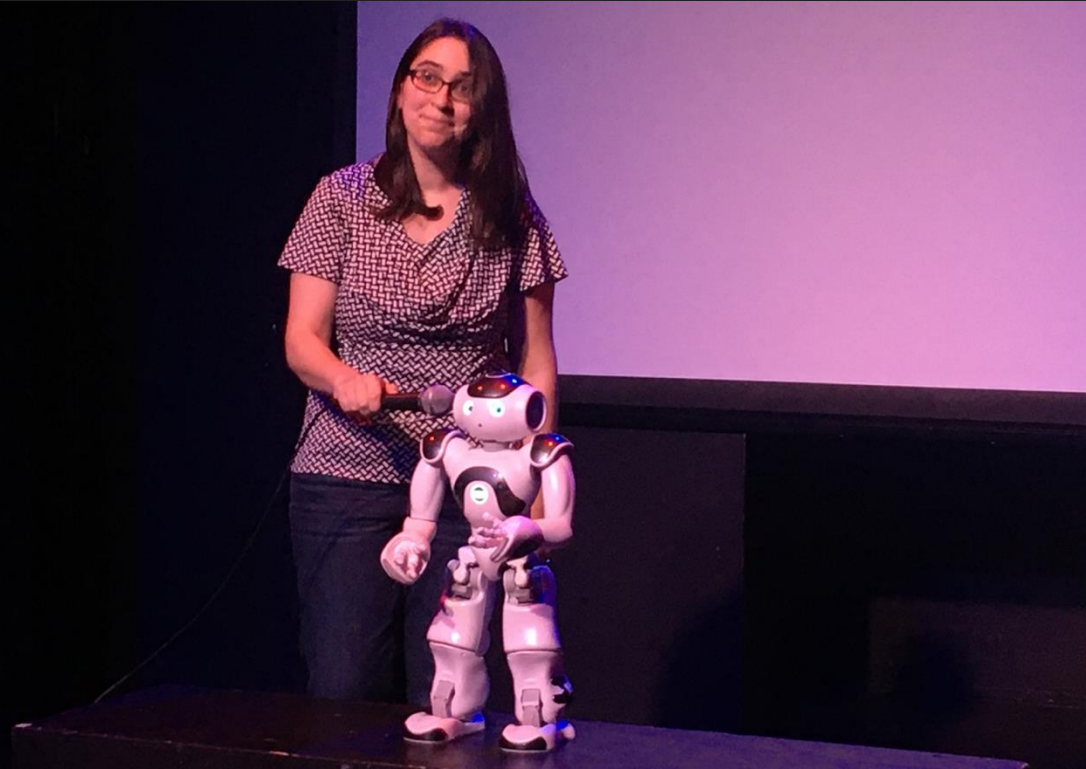
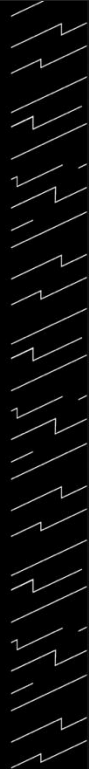
Improbabilities @ Komedia, Brighton Fringe,
26 May 2024 / Photos: William Ranieri

AI co-creating real-time comedy dialogue



NAOMI FITTER & JON THE ROBOT

RESEARCHER, COMEDIAN
ROBOT



AI for inspiration and world building

- “Yes, Android” (2017)
Bad Dog Theatre, Toronto
- ”Alexa, Improvise” (2018)
San Francisco
- “Improvised TEDx” (2019)
Thomas Winters,
Kory Mathewson
- “ClimateProv” (2022)
BeFantastic, Bangalore
- “Et l’I.A. créa l’impro” (2023)
La Claque, Nouméa



Photo: Second City Toronto

AI for inspiration and world building



“Plays by Bots” - Edmonton International Fringe Festival, August 2022.

THE BEER TENT REVIEWS Edmonton Fringe Festival of March 2022

REVIEW: PLAYS BY BOTS

The premise is simple. Dramatron writes half of a play, complete with stage directions.

By Miki Zwarich

DeepMind, according to its website, consists of “a team of scientists, engineers, ethicists and more, committed to solving intelligence, to advance science and benefit humanity.” At the Fringe, this hive mind has benefited humanity by creating Dramatron: a bot fed with nuggets of wisdom from all corners of the internet that has written one, uh, “unique” play for each performance.

The premise is simple. Dramatron writes half of a play, complete with stage directions. Scripts and costumes are prepared and sealed prior to the show. Performers (who are not bots) have never seen them before and must do their best to bring Dramatron’s vision to life. Performers then improvise the latter half of the show to try and finish what Dramatron started.

The opening night’s result took us to “The Pool Pit,” a dingy dive bar, where Lola the bartender (Gordie Lucius), Rosie the boozehound (Tyra Banda), lounge singer Teddy (Jacob Banigan), and Gerald the rich guy (Michael Johnson) discuss an upcoming birthday, a new hat, and torching a luxury car. An honourable mention goes to Banigan, who mastered Dramatron’s voice and seamlessly took it off-script for the remainder of the show, much to the delight of the howling audience.

Plays by Bots proves that artificial intelligence can in fact write a hit Fringe play. Each night promises an equally bizarre show performed by a rotating cast of veteran improvisers. If Friday night’s performance was any indication of the shows to come, you are guaranteed to laugh until your face hurts.

AI for inspiration and world building



Live performance with AI in digital spaces



Photos: Failed to Render

Live performance with AI in digital spaces



Boyd Branch et al (2021) "Tele-Immersive Improv: Effects of Immersive Visualisations on Rehearsing and Performing Theatre Online", SIGCHI.

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Live translation in multilingual theatre



Piotr Mirowski et al (2020) "Rosetta Code: Improv in Any Language", ICCG.



"AI: When a Robot Writes a Play" (2021) THEaiTRE



"Beyond Human" (2019) Gunter Loesel, Nicole Erichsen

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Q3 - What drew you to the show?

I'm curious about robots/AI.	95
I love improv comedy.	27
Something else.	18
I love robots.	11
I'm a fan of one or more of the human improvisers.	6

Q4 - Before watching the show what were your feelings about robots/AI?

Curious about them.	76
Love them.	21
Excited about them.	18
Ambivalent about them.	14
Skeptical about them.	13
Indifferent about them.	9
Something else.	2
Afraid of them.	2
Angry about them.	1

Q5 - During the show I found myself mostly:

Watching improvisers work around the limitations of robots.	78
Laughing with the human improvisers.	32
Laughing at the human improvisers.	12
Laughing at robots.	9
Watching for what could go wrong with robots.	7
Something else.	5
Watching robots work around the limitations of humans.	4
Laughing about robots.	4
Laughing with robots.	3
Laughing in spite of robots.	2

Q6 - What I liked most about the show was:

Watching the robot come up with entertaining and funny ideas.	14
Watching the improvisers try to make sense of the strange and funny ideas generated by the robot.	98
Watching the robot and humans create funny and entertaining stories together.	39
Something else.	5

Q7 - I felt like A.L.Ex, the robot/AI, :

Performed better than I expected.	25
Performed as well as I expected.	50
Performed worse than I expected.	29

Q8 - I mostly found the show:

Entertaining	62
Original	24
Confusing	12
Something else	4
Educational	2
Provocative	0

Q9 - After watching the show:

I am more excited about using AI tools for creativity.	39
I am less optimistic about robots as creative storytellers.	29
Something else.	14
I am more optimistic about robots as creative storytellers.	14
I am less interested in using AI tools for creativity.	8

Q10 - Watching the show I found myself:

Empathising and caring about A.L.Ex.	7
Neutral or indifferent to A.L.Ex.	24
Rooting for A.L.Ex to succeed.	32
Rooting for A.L.Ex to fail.	2
Rooting for the humans to outperform A.L.Ex.	16
Rooting for A.L.Ex to outperform the humans.	10
Forgetting A.L.Ex was a robot.	4
Something else.	8

Q12 - As a performer, A.L.Ex (The robot/AI) appeared:

machine like	65.69
human like	28.78
artificial	60.39
lifelike	29.76
to communicate naturally	34.23
to communicate unnaturally	56.35

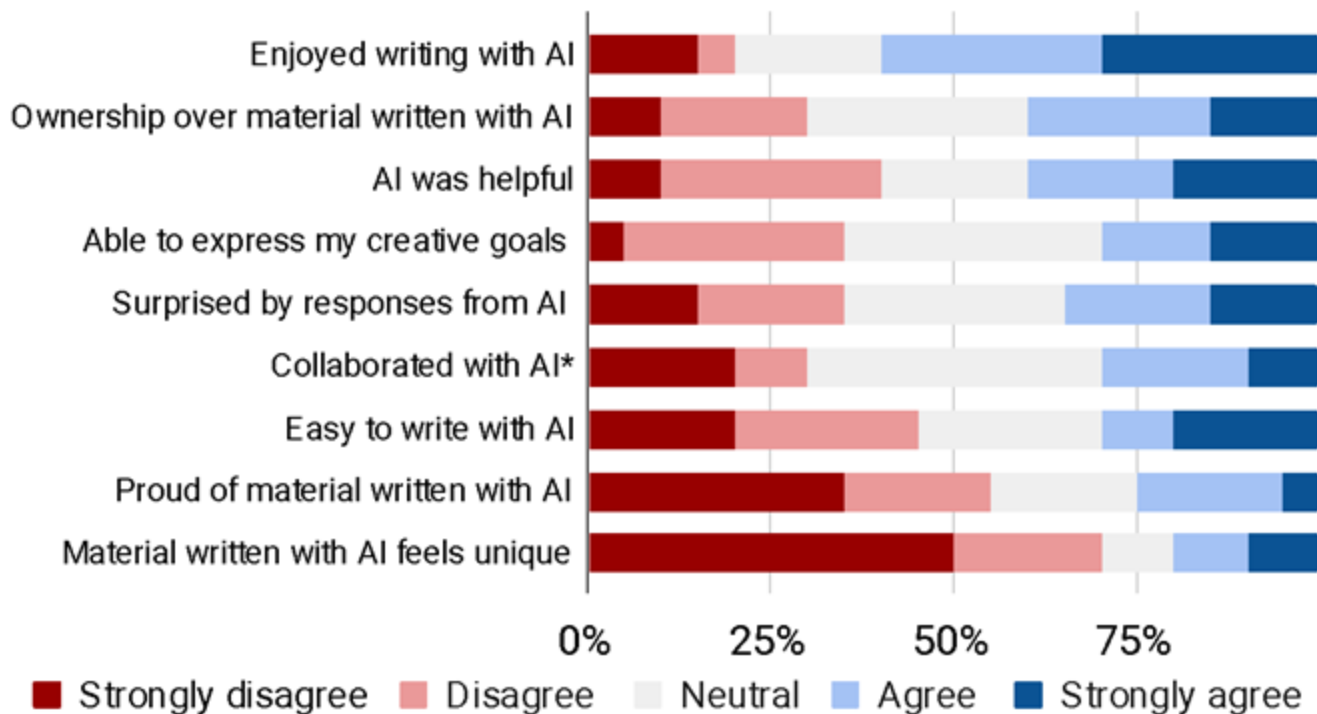
"it would be very PC and not really taking any risks, [...] as this sort of bland kind of cruise ship style entertainer or maybe like something you'd see in comedy from the '50s and '60s, but less racist" (Participant 10)



Mirowski et al (2024) "A Robot Walks into a Bar: Can Language Models Serve as Creativity Support Tools for Comedy? An Evaluation of LLMs' Humour Alignment with Comedians", FAccT.

Quantitative analysis of LLM Creativity Support Tools

AI (LLMs) as creativity support tool for writing comedy



Improvisational ethos: make your stage partner look good



Thank you!

piotr.mirowski@computer.org