

Mozart in the box

Interacting with AI tools for music creation

Alex Palladini

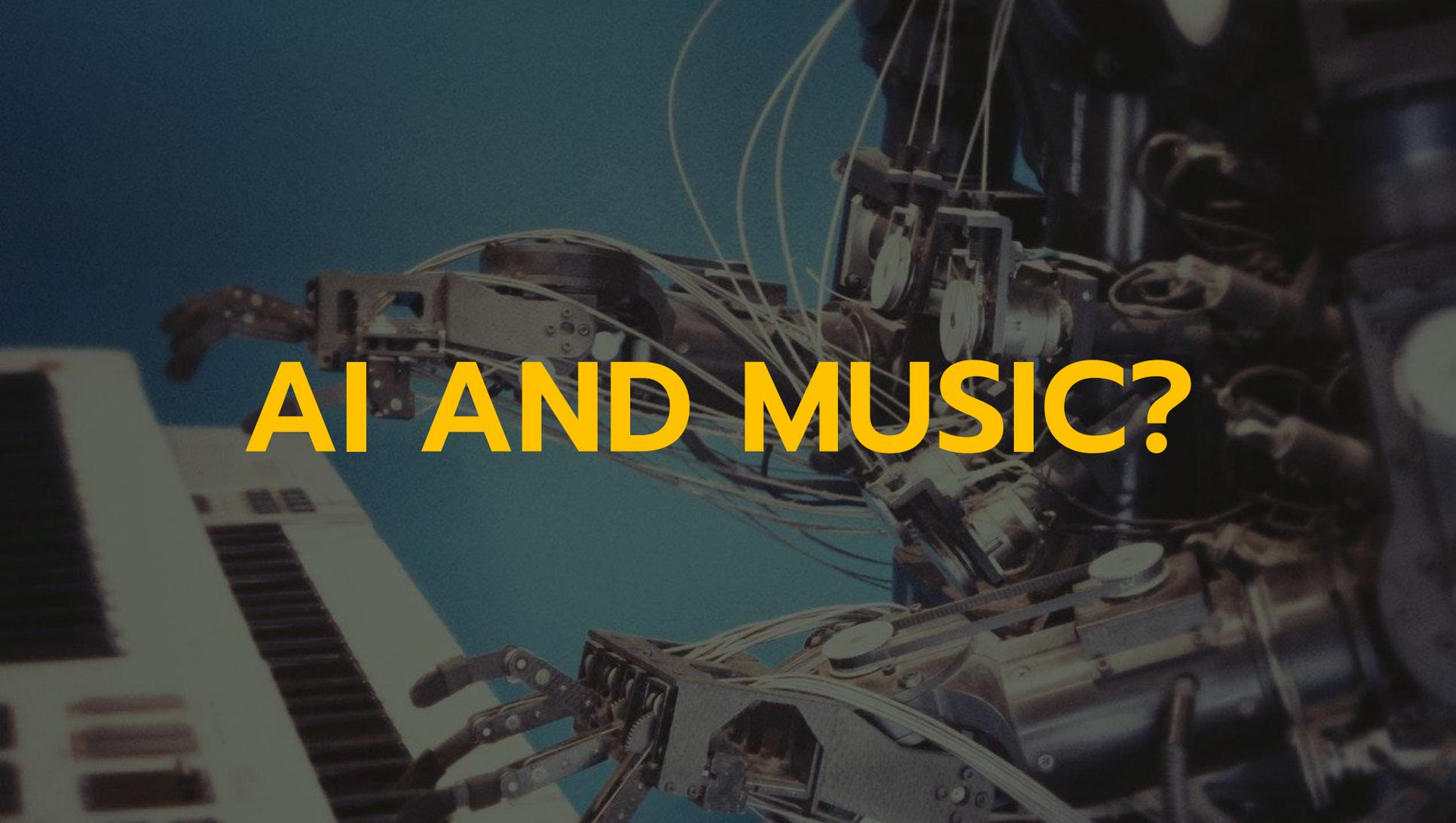
MIDAS MUSIC TRIBE





MIDAS

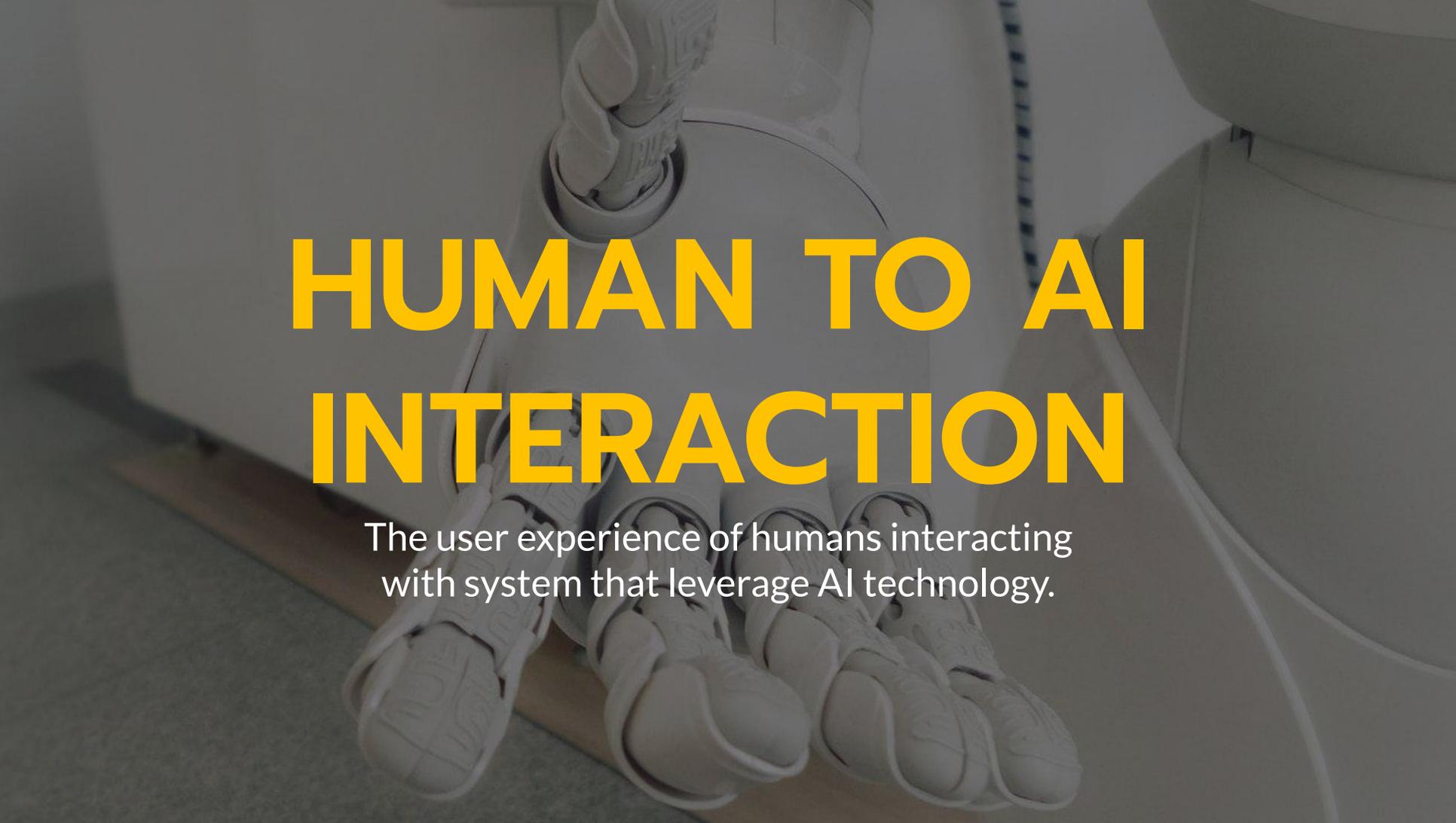
MUSIC TRIBE



AI AND MUSIC?

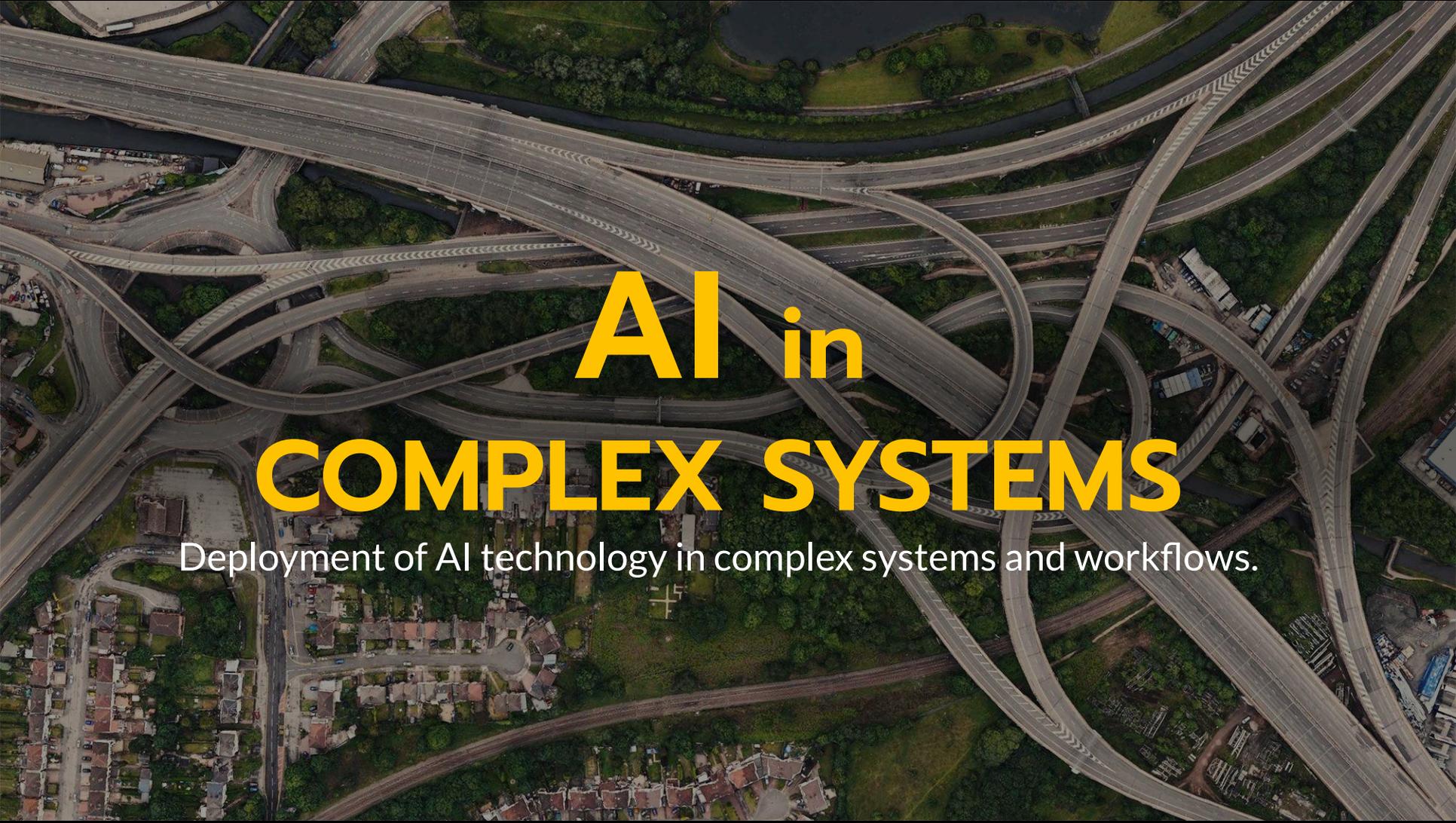
A close-up photograph of a hand holding a glowing crystal ball. The crystal ball is the central focus, emitting a warm, golden light. Inside the ball, a faint, ethereal image of a person is visible. The hand is positioned around the ball, with fingers slightly spread. The background is dark, making the glowing ball stand out. Overlaid on the image is the text "WHAT DO YOU EXPECT?" in a bold, yellow, sans-serif font, centered horizontally and vertically.

**WHAT DO YOU
EXPECT?**

A white humanoid robot is shown from the waist down, standing on a wooden plank. The robot is wearing white sneakers with white laces. The background is a plain, light-colored wall. The text is overlaid on the robot's legs and the plank.

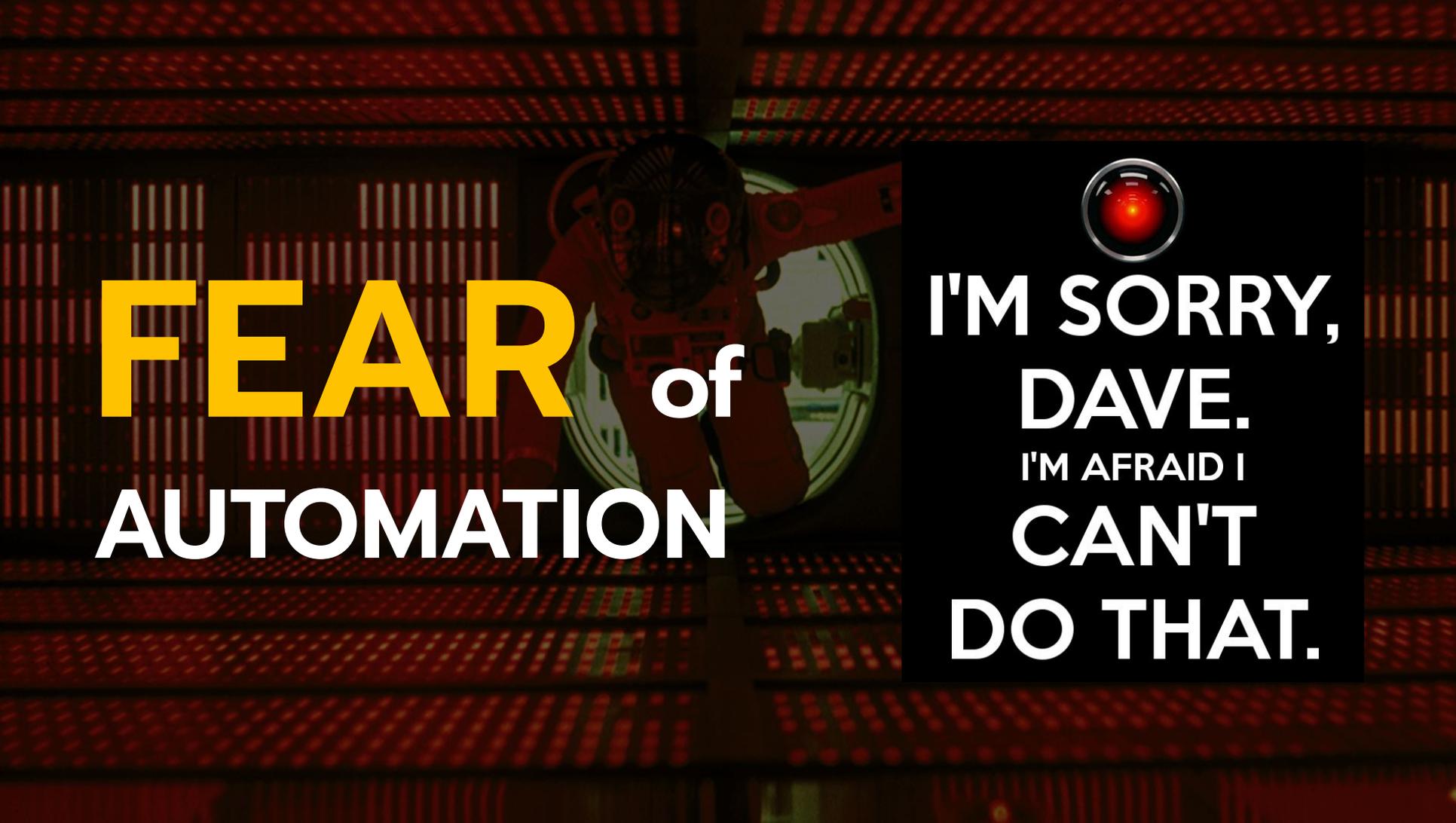
HUMAN TO AI INTERACTION

The user experience of humans interacting with system that leverage AI technology.



AI in COMPLEX SYSTEMS

Deployment of AI technology in complex systems and workflows.



FEAR of
AUTOMATION



**I'M SORRY,
DAVE.
I'M AFRAID I
CAN'T
DO THAT.**

FEAR OF AUTOMATION



Tesla Model 3

FEAR OF AUTOMATION



James Locke @arctechinc

24 Mar

Replying to @elonmusk

so does this mean no heads up display in Model 3? How will Tesla handle speedometer and Instrument Cluster information?



Elon Musk ✓

@elonmusk



The more autonomous a car is, the less dash info you need.
How often do you look at the instrument panel when being driven in a taxi?

2:47 PM - Mar 24, 2017

♡ 735 💬 274 people are talking about this



FEAR OF AUTOMATION



Grae_person74 @GRae_1974 · 2 Aug 2017



Replying to [@elonmusk](#)

ALL THE TIME, no matter who is driving. Me. You. AI. Grandpa Simpson.



Fred Janon @fjanon · 29 May 2017



Replying to [@elonmusk](#) [@arctechinc](#)

Depends on the taxi... In a Parisian taxi, my eyes are glued to the speedometer.
HUD = zee man is feeling like a jet fighter pilot.



ValesAlex @Alevale111 · 30 May 2017



Replying to [@elonmusk](#) [@arctechinc](#)

actually im sorry to say this but it's one of the things i focus the most, i like to see how im driven no matter who



Jarjeh Fang @bluejayfang · 3 Apr 2017



Replying to [@elonmusk](#) [@arctechinc](#)

Constantly, in wide eyed terror.



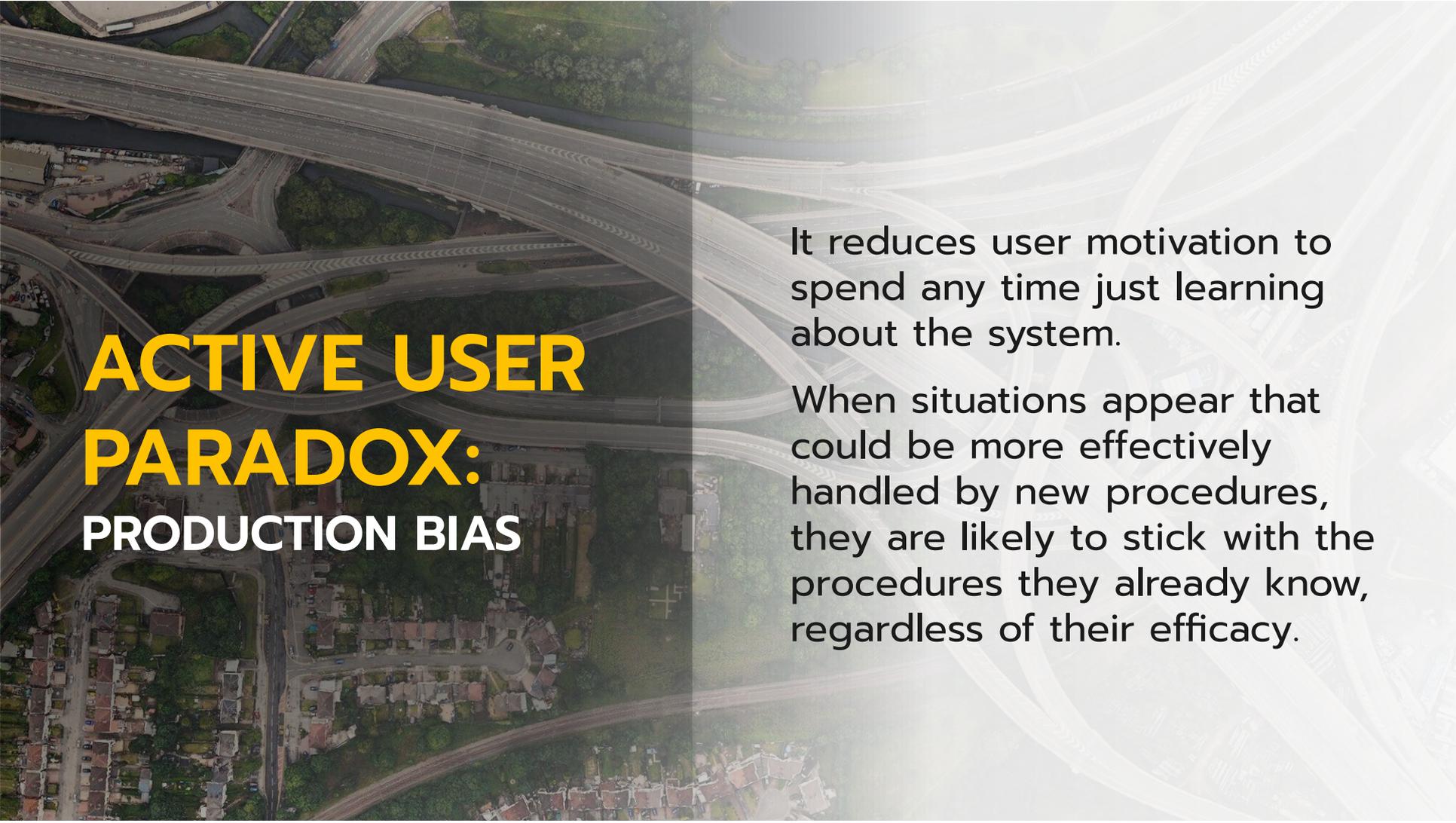
PSYCHOLOGY OF COMPLEX SYSTEMS

Imagination is easy. Innovation is hard.



COMPLEX SYSTEMS ARE HARD TO INNOVATE

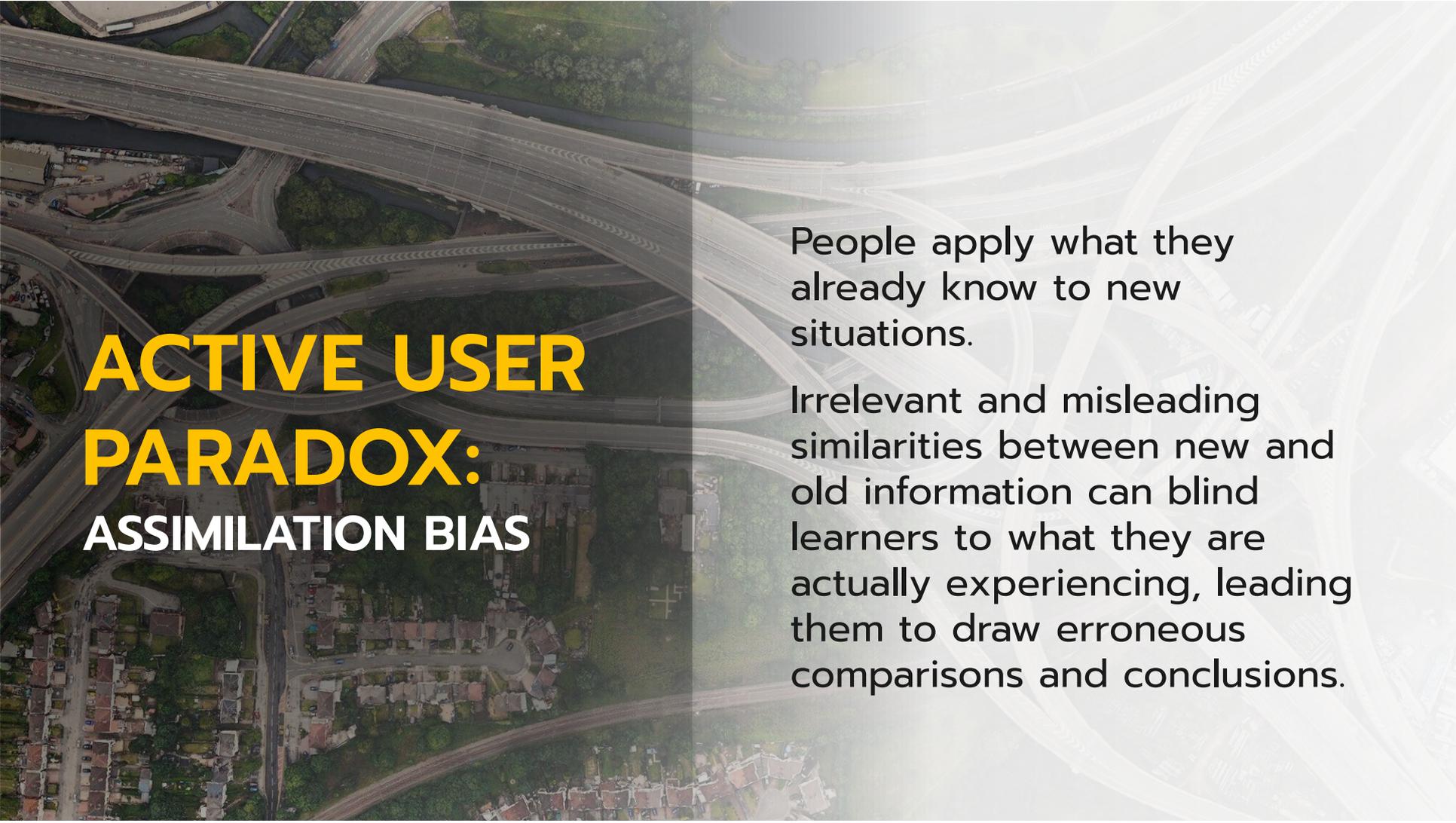
1. Designed by experts for experts.
2. Have many critical parameters and controls.
3. Require intense training and learning effort.
4. Mistakes and failures must be avoided at all costs.
5. Their users are extremely conservative.



ACTIVE USER PARADOX: PRODUCTION BIAS

It reduces user motivation to spend any time just learning about the system.

When situations appear that could be more effectively handled by new procedures, they are likely to stick with the procedures they already know, regardless of their efficacy.



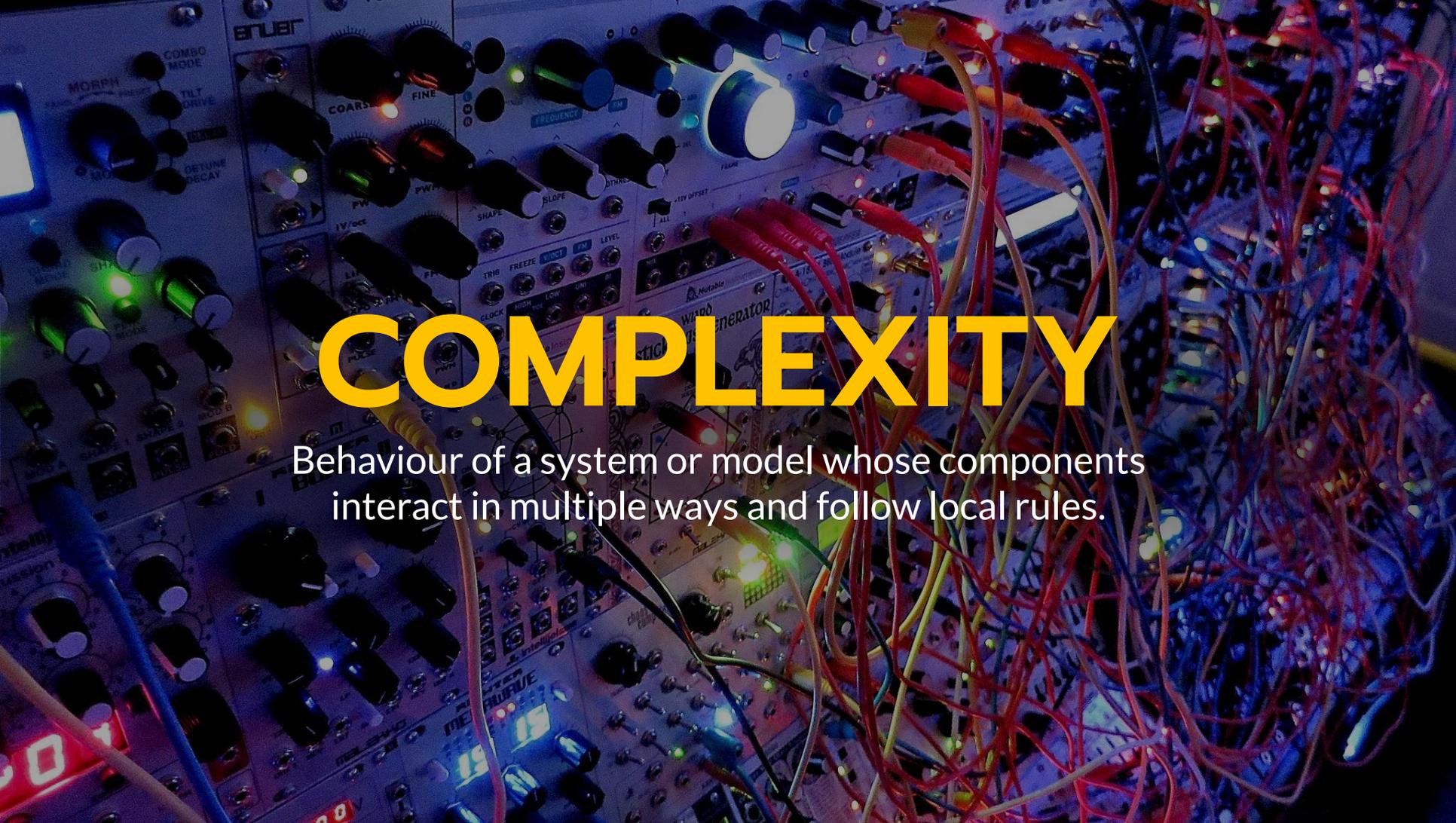
ACTIVE USER PARADOX: ASSIMILATION BIAS

People apply what they already know to new situations.

Irrelevant and misleading similarities between new and old information can blind learners to what they are actually experiencing, leading them to draw erroneous comparisons and conclusions.



WHY MUSIC?



COMPLEXITY

Behaviour of a system or model whose components interact in multiple ways and follow local rules.



EXPERIENCE

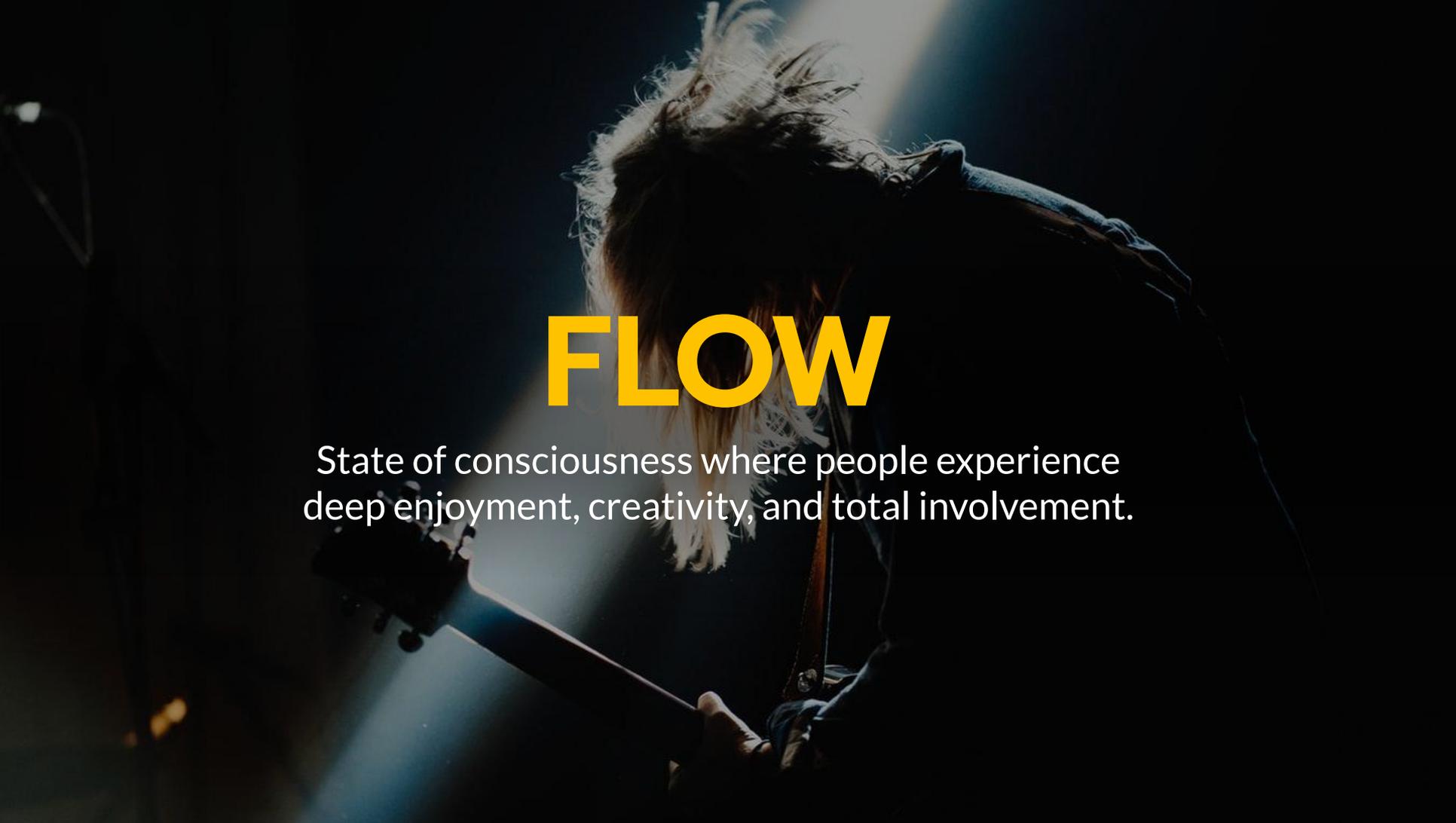
The knowledge of a subject gained through involvement and exposure to it.





MASTERY

Comprehensive knowledge or skill in a particular subject or activity.

A musician with long, light-colored hair is shown from the back, playing a guitar. The scene is dimly lit, with a strong spotlight from above illuminating the musician's hair and the guitar. The background is dark, with some faint light sources visible on the left side.

FLOW

State of consciousness where people experience deep enjoyment, creativity, and total involvement.



CREATIVITY

The drive to create something new, surprising and that has value.

MUSIC DECONSTRUCTED

Composition



Performing/Recording



Mixing & Mastering



MUSIC DECONSTRUCTED

Composition



Performing/Recording



Mixing & Mastering



MIDAS

MIXING AND MASTERING





Midas To Launch The World's First AI And Cloud Based Mixing Console Platform

Hollin Jones on Aug 30, 2019 in News 0 comments

FEAR OF AUTOMATION IN MUSIC



MIDAS

29 August at 20:00 · 🌐

A quick look at artificial intelligence on the Midas Heritage-D 🗨️ 📺 🤖

http://bit.ly/HD96_AI



YOUTUBE.COM

Midas Heritage-D AI

A quick look at artificial intelligence on the Midas Heritage-D.

FEAR OF AUTOMATION IN MUSIC



Steve

31 August at 03:30

Just saw the Ai thing. What a waste of r&d. Your allowing the console to do my job based on what? Does the console know that's an 808 and not a 22 inch DW? Does the console know I put a 121 Royer on a Bogner or does it think i'm using a 57 on a Marshall? This shit does not belong in a pro desk. I see desks with libraries of other peoples sounds. Never even listened to them, I do store my own libraries for when i'm running short on soundcheck time but never a preset from someone else. Can't we use our costly r&d on important shit we have to deal with every day that may make the console even more useful like an industry standard clear com input that works down your existing digital snake and allows you to rout it to your in ears, phones, que wedge or anywhere you want, give it its own talk button that uses your shout mic or whatever, and can you have it flash some of the console lights when someone is calling. Sorry for the rant but I personally don't know anyone (and I know about a 150 pro touring guys) that spends \$35k and up on a console and uses eq suggestions from the console. I'm not implying \$35k is a lot, it's not for a pro desk. My daily desk costs 3 times that. I expect this from MI class gear, not this target market.



65

153 comments

FEAR OF AUTOMATION IN MUSIC



Matt 🙋 Has anyone involved in the AI design actually mixed a few thousand shows?



Matt 🙋 All this AI thing is going to do is produce a crop of lousy engineers who have no idea how to achieve a desired result, or indeed, know if the AI result actually "sounds" good, preferring to simply BELIEVE that it does since the AI said so. Intentionally or not, this will further cut ears out of the equation.



Muso Hi Steve,

I understand exactly where your coming from.

I think that sort of thing would have not been in the desk if it was solely a Midas company.

When you are owned & have r&d by a Mi company that core income is the MI market, you will inevitably get non-pro contamination's into their products!!!

FEAR OF AUTOMATION IN MUSIC



Josh 🙌 pro touring guy here.... pretty excited for the AI. Demoed it a few months ago and it's going to be able to replace one of my must have Waves chains. Did you hear about the new Yamaha AI? It can intelligently gate a vocal and reduce bleed. When I tried this on HD and it worked I was so happy... thank you Midas for developing awesome features.

Like · Reply · 5d



Josep Please do not be retrograde and look to the future of the new generation of consoles. MIDAS is offering a step forward, it is your decision to get on the train of the future. Bravo MIDAS, for bravery.

Like · Reply · 5d · Edited



Raphael Machine learning will be the dominating factor in our lives during the next 10 to 20 years. That's just how it is. You don't have to like it. Regardless of where you look, it's close to useless right now, gimmicky stuff, but it's absolutely clear that this stuff has come to stay and will expand and thrive. [Peter Sadler](#) was pretty open about the fact that this is work in progress and this is more a matter of "it's there, once the world is ready for it". At that point, it will transform into what every you need it to be. That's the whole idea of Ai. ...

Like · Reply · 4d



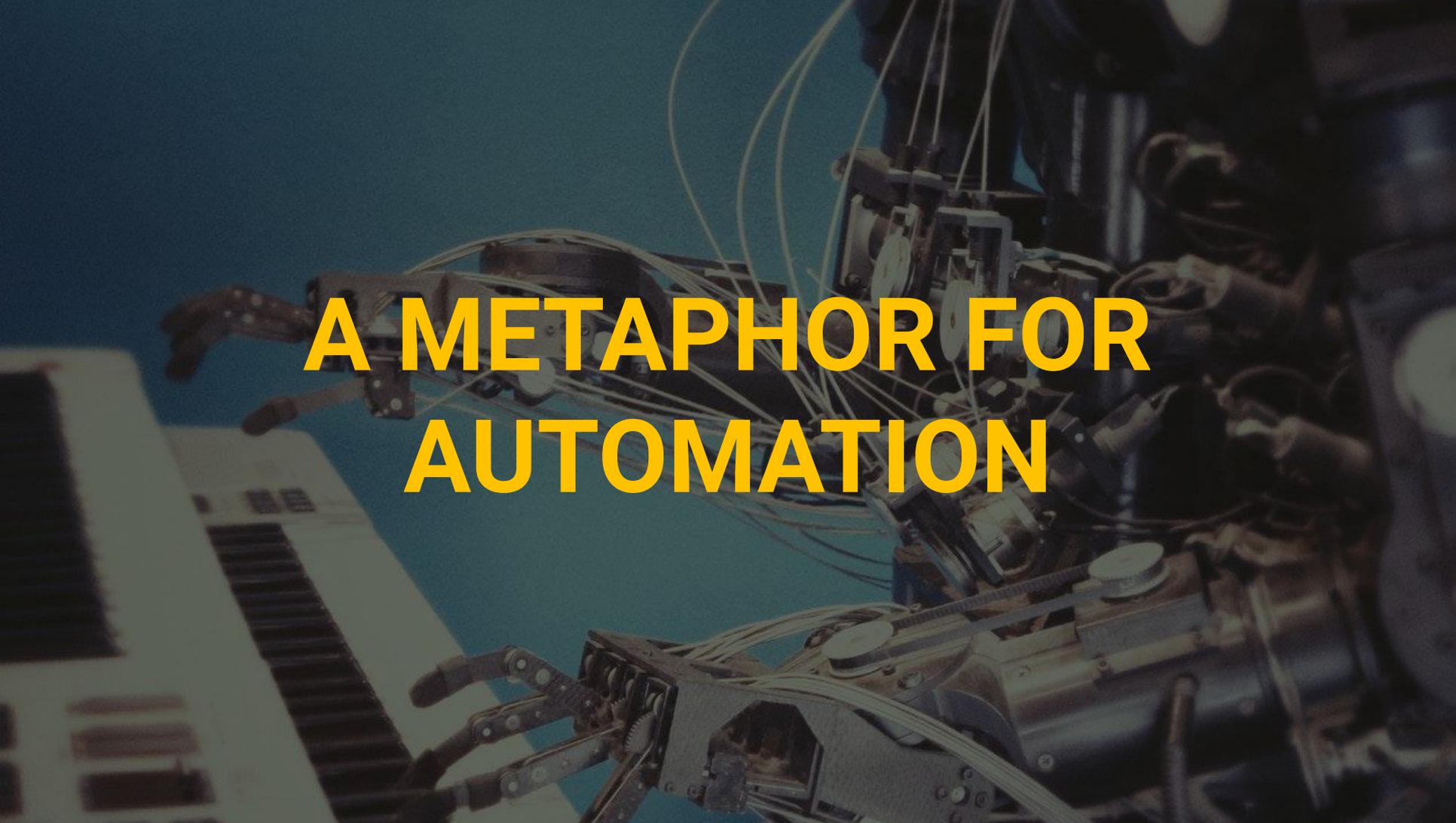
FEAR OF AUTOMATION IN MUSIC

#1

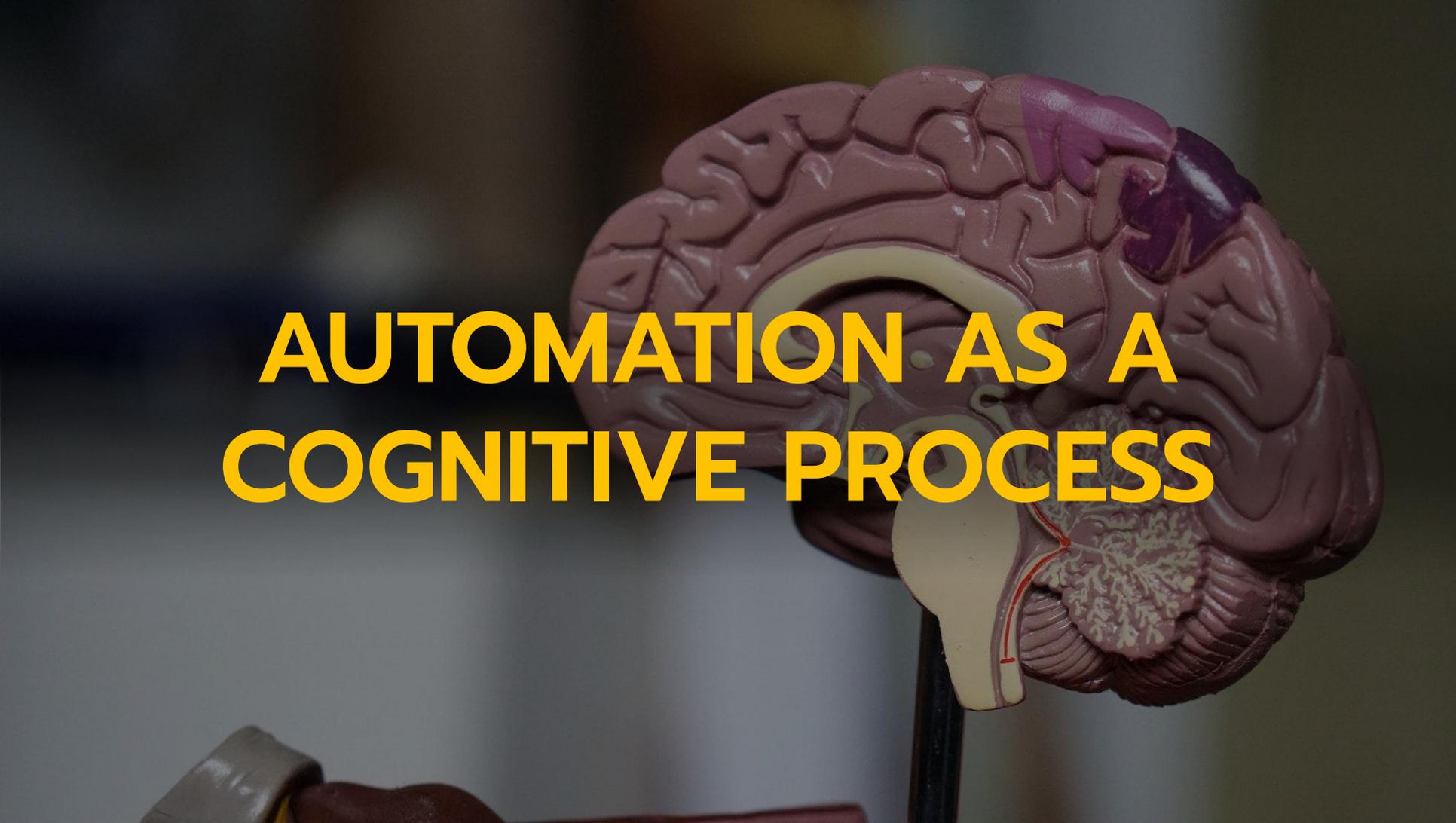
Explain the purpose of the Automation.

2

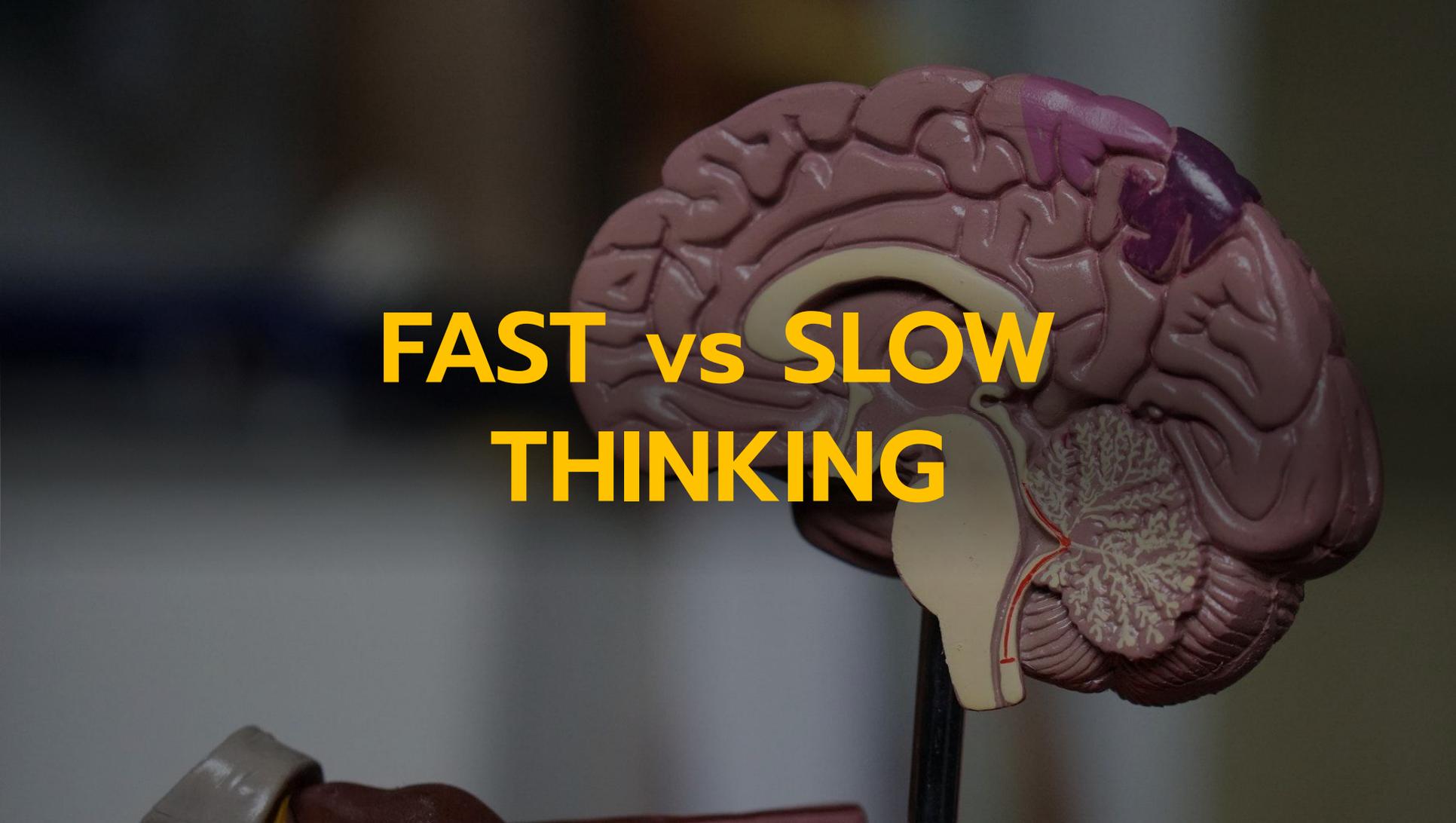
Make clear what the system can do and how well it can do it.



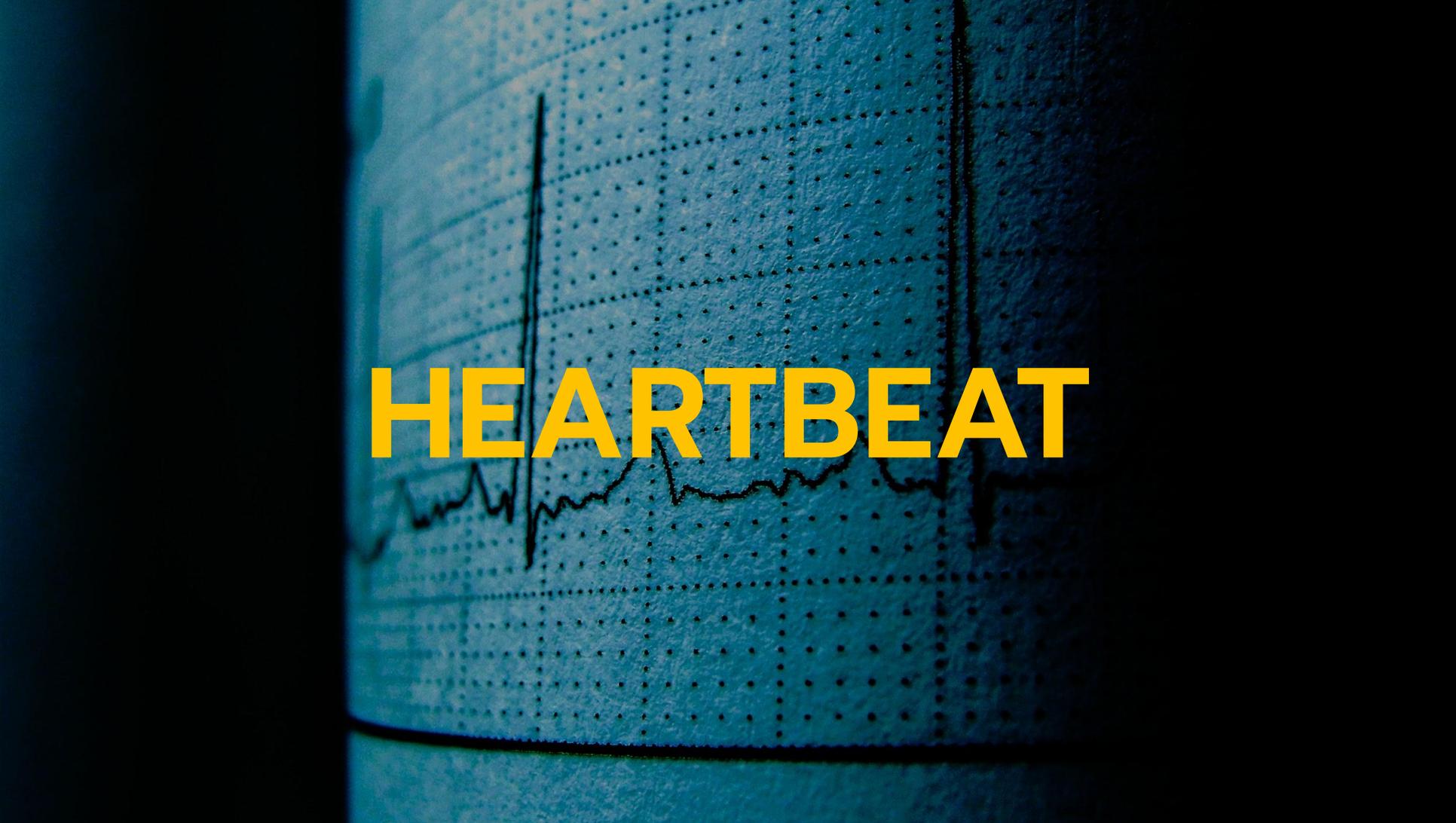
A METAPHOR FOR AUTOMATION



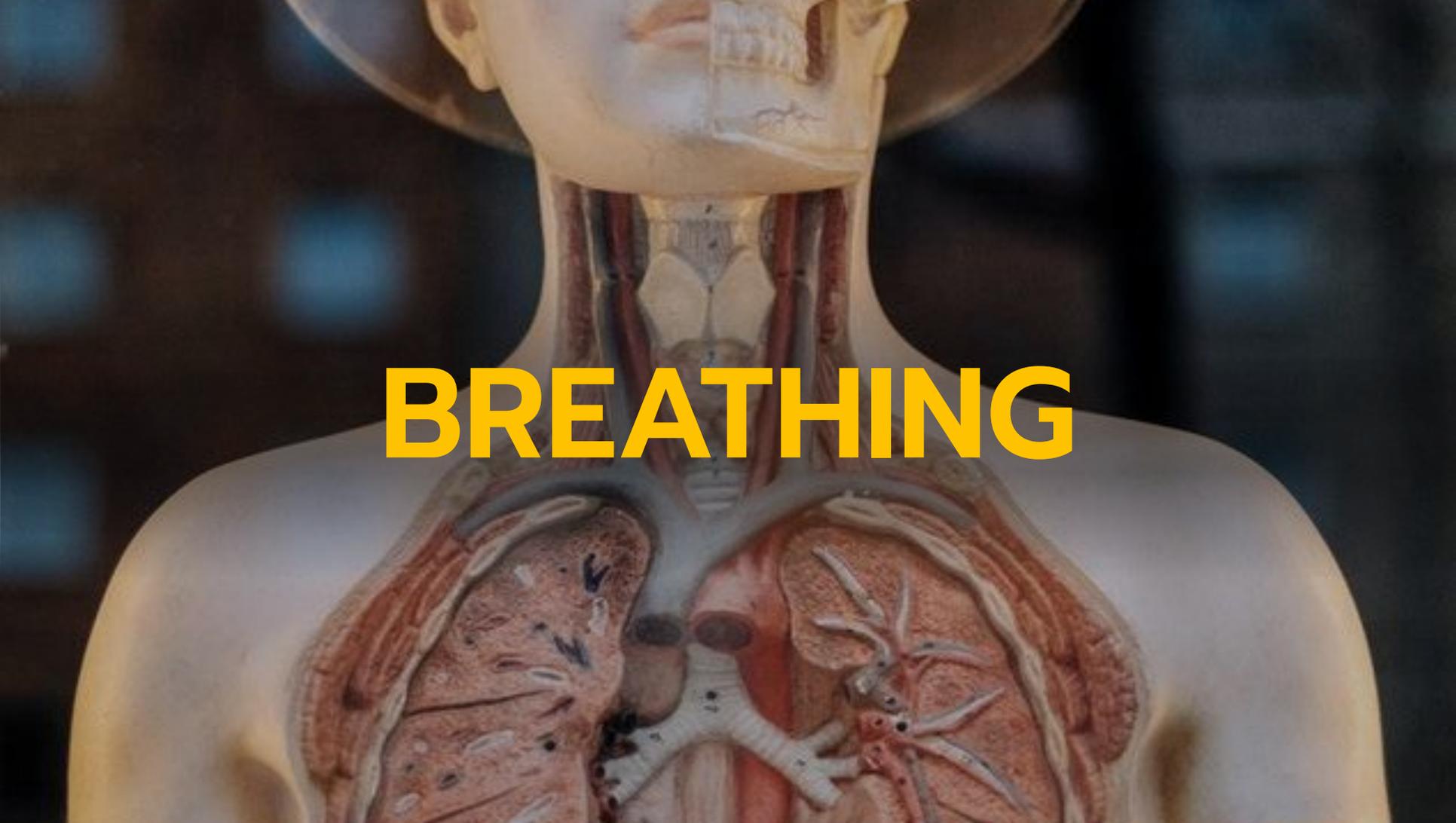
AUTOMATION AS A COGNITIVE PROCESS

An anatomical model of a human brain in a sagittal view, showing the cerebral cortex, cerebellum, and brainstem. The model is mounted on a black stand. The text "FAST vs SLOW THINKING" is overlaid in the center in a bold, yellow, sans-serif font. The background is a dark, blurred gradient.

**FAST vs SLOW
THINKING**

The image features a close-up of a medical ECG strip with a blue grid. A black line representing a heartbeat is visible, with a prominent vertical spike. The word "HEARTBEAT" is printed in large, bold, yellow capital letters across the center of the strip. The background is dark, making the blue grid and yellow text stand out.

HEARTBEAT

An anatomical model of the human respiratory system, showing the trachea, bronchi, and lungs. The model is a light-colored plastic or resin figure with internal organs and structures colored in realistic shades of red, pink, and brown. The trachea is visible in the neck, leading down to the bronchi and the lungs. The lungs are shown with their characteristic spongy texture and branching airways. The model is set against a dark, blurred background.

BREATHING

A close-up, over-the-shoulder view of a person driving a car at night. The driver's hands are on the steering wheel, and a watch is visible on their left wrist. The car's dashboard and center console are partially visible. The background shows a blurred cityscape with warm, glowing lights, suggesting a sunset or city lights at dusk. The overall mood is focused and serene.

LEARNED TASKS

TYPES OF AUTOMATION

1. Information acquisition
2. Information analysis
3. Decision selection
4. Action implementation

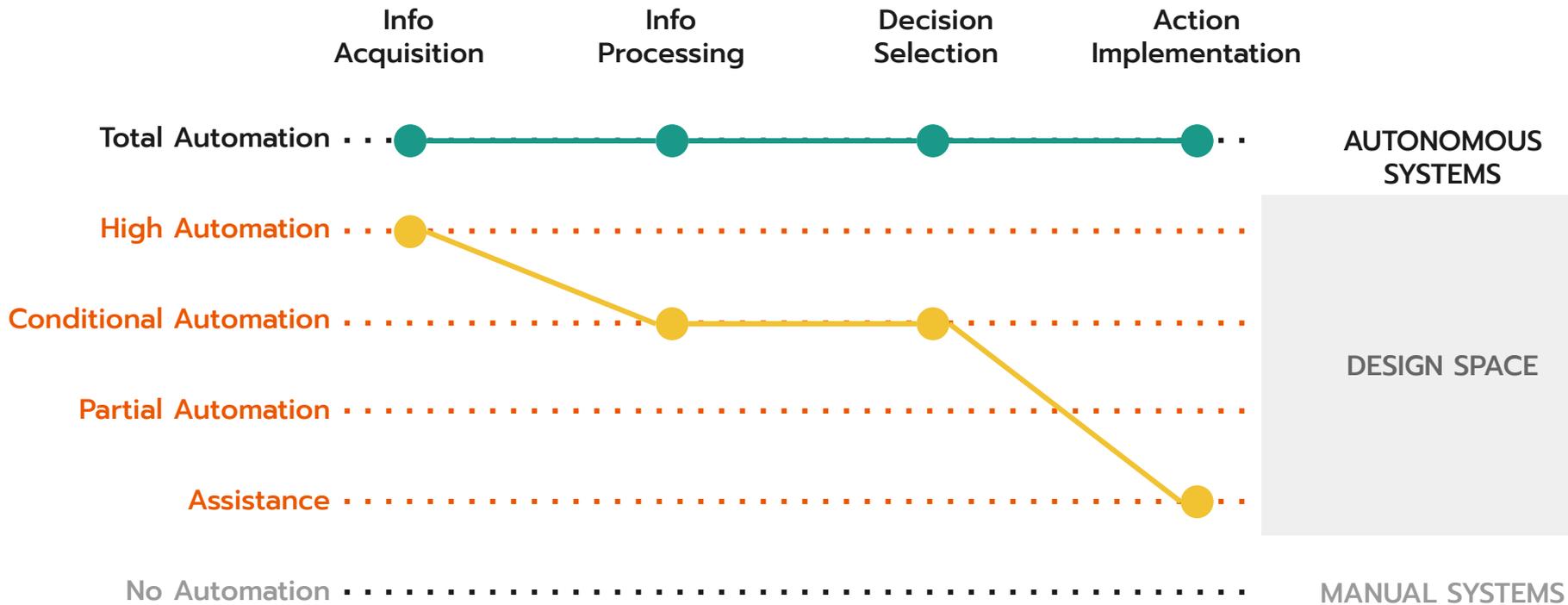
Parasuraman et. al. "A model for Types and Levels of Human Interaction with Automation"
IEEE Trans. On Systems, Man and Cybernetics, 2000

LEVELS OF AUTOMATION

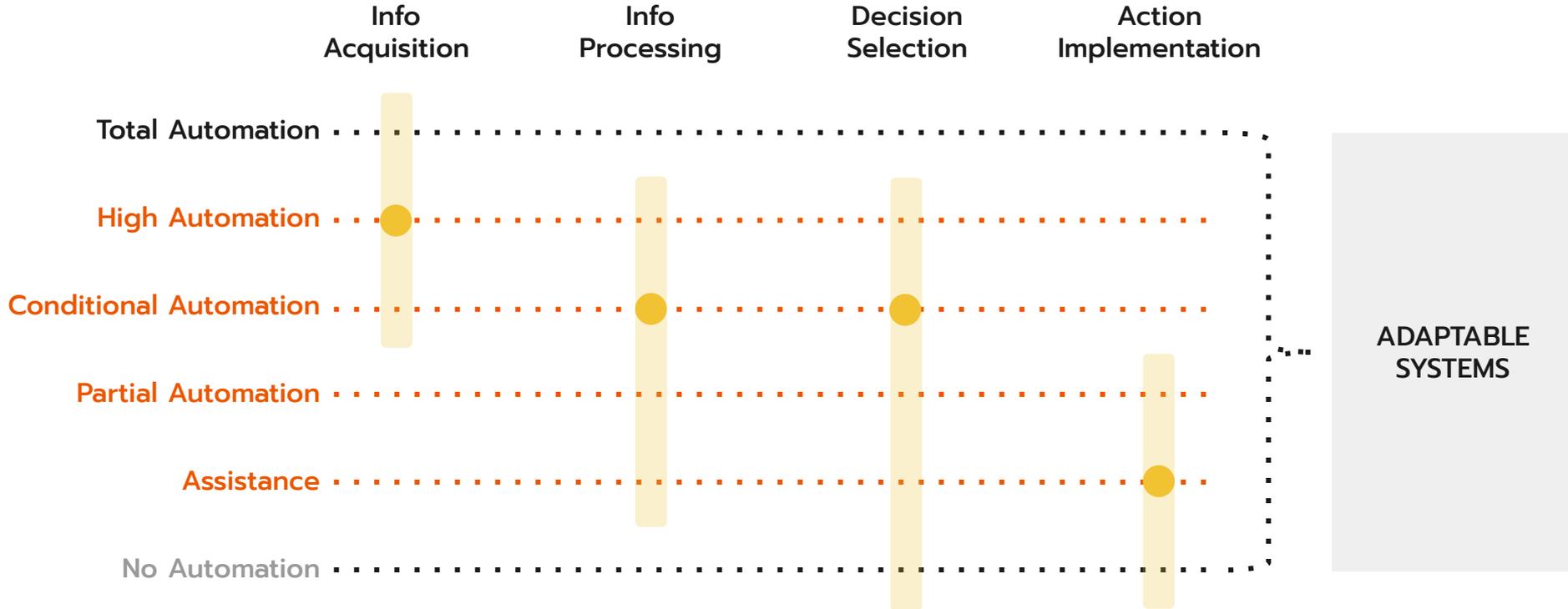
0. No Automation
1. Assistance
2. Partial Automation
3. Conditional Automation
4. High Automation
5. Total Automation

Parasuraman et. al. "A model for Types and Levels of Human Interaction with Automation"
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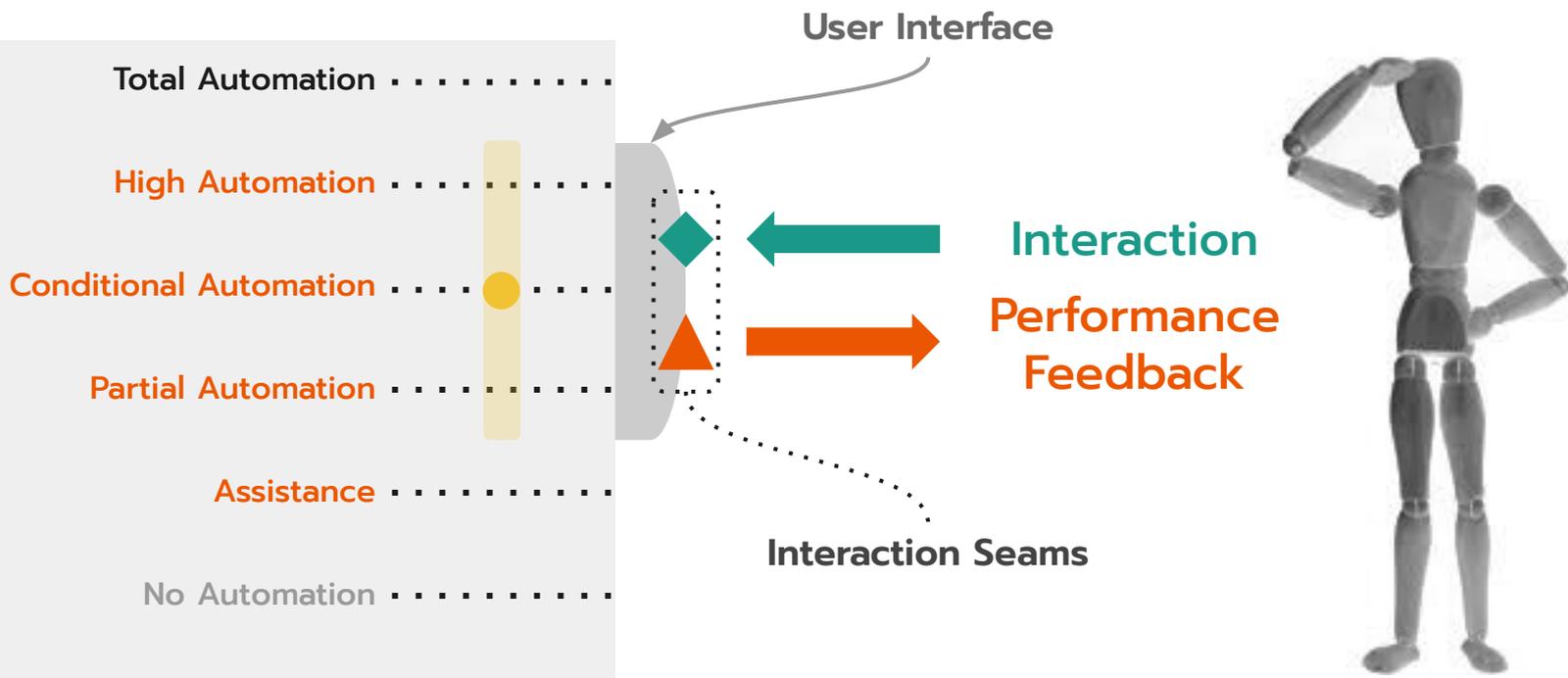
SYSTEM ANALYSIS



VARIABLE LEVELS OF AUTOMATION



ADAPTABLE AUTOMATION AND INTERACTION



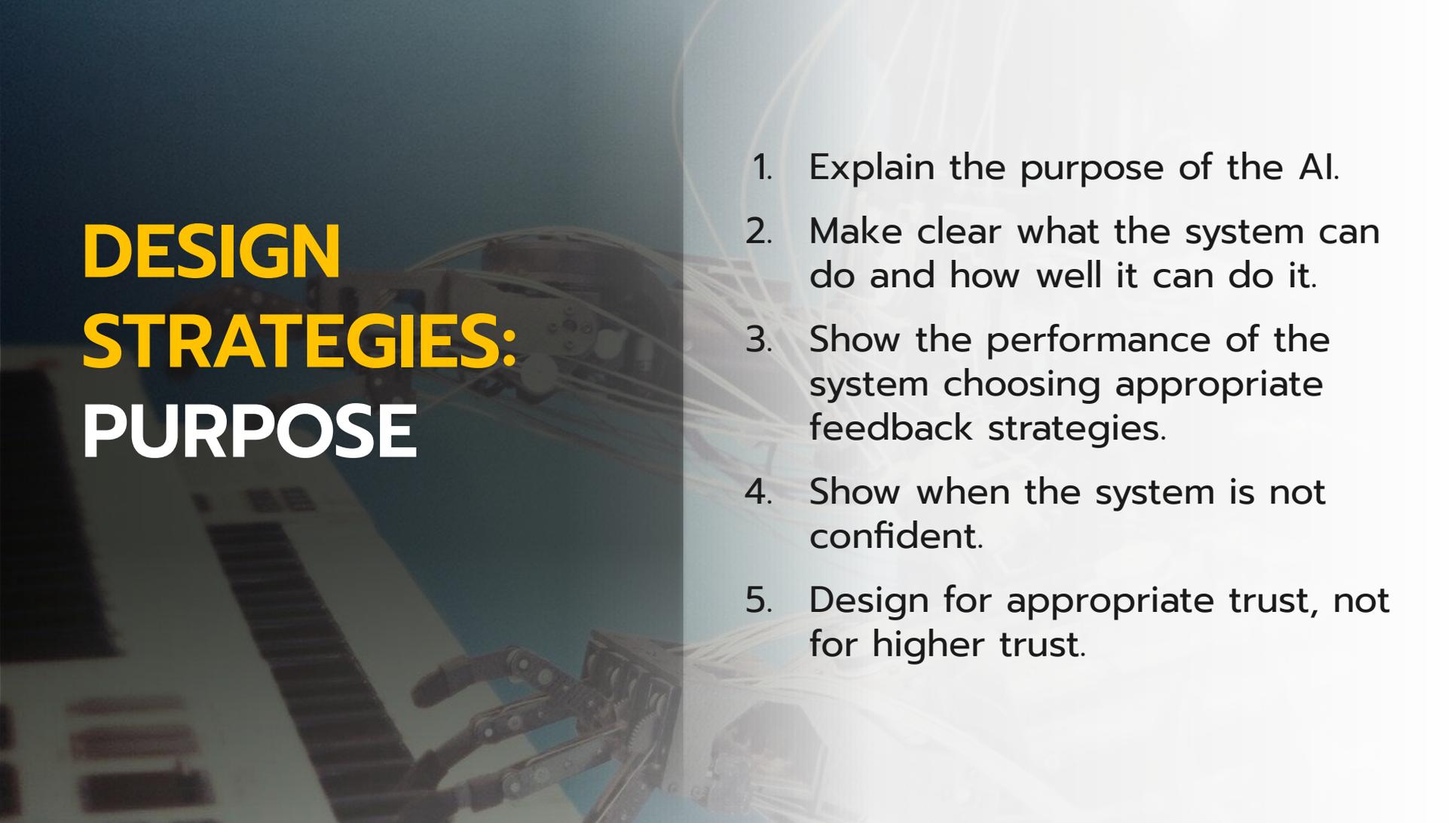
PERFORMANCE FEEDBACK STRATEGIES

1. **Optimistic**
Show everything as if it was correct
2. **Pessimistic**
Show only what is known to be correct
3. **Cautious**
Show the uncertainty of the system
4. **Opportunistic**
Exploit uncertainty to improve the system
(active learning)



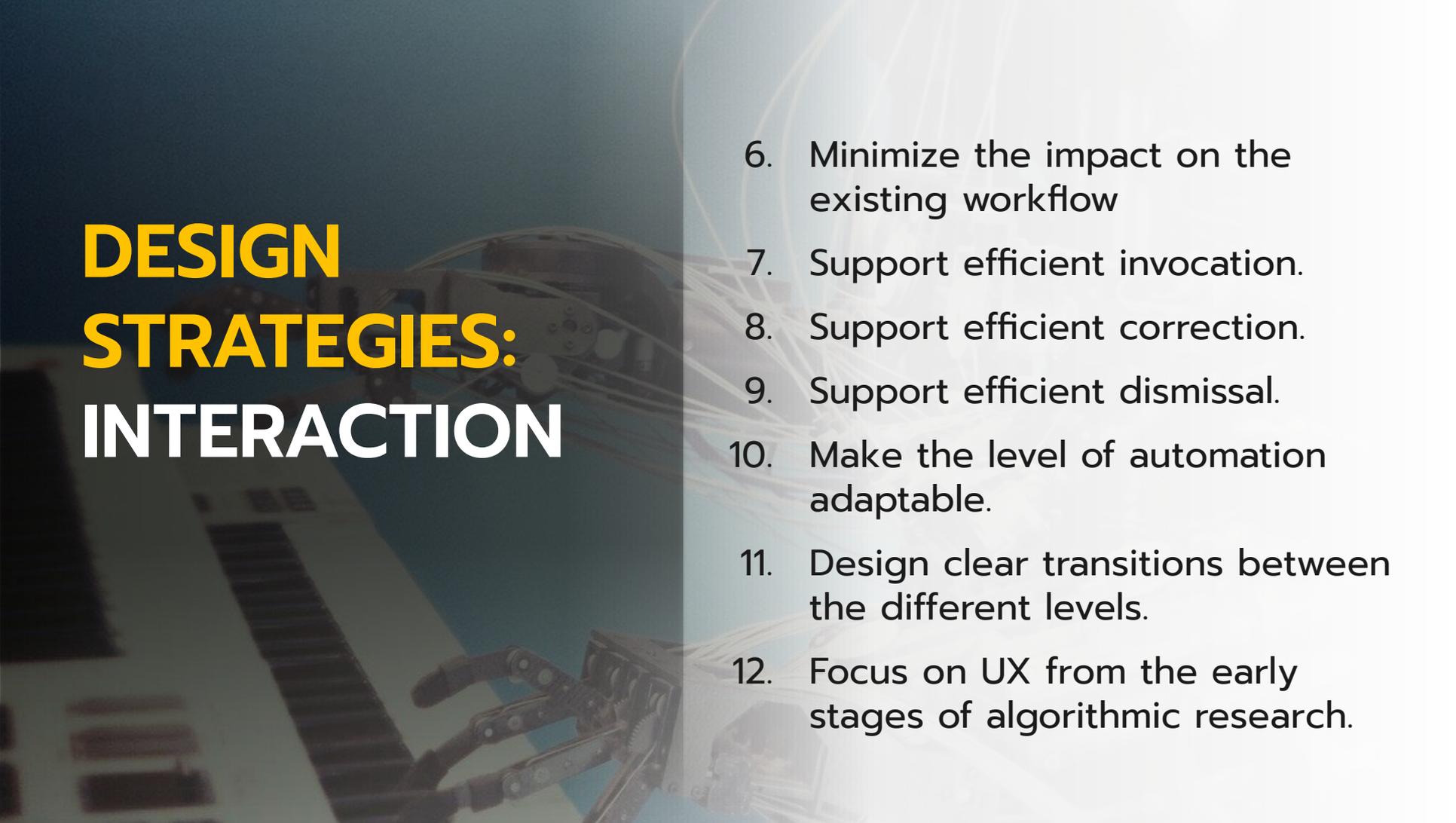
OUR VISION

Intelligent audio machines & augmented creativity.



DESIGN STRATEGIES: PURPOSE

1. Explain the purpose of the AI.
2. Make clear what the system can do and how well it can do it.
3. Show the performance of the system choosing appropriate feedback strategies.
4. Show when the system is not confident.
5. Design for appropriate trust, not for higher trust.



DESIGN STRATEGIES: INTERACTION

6. Minimize the impact on the existing workflow
7. Support efficient invocation.
8. Support efficient correction.
9. Support efficient dismissal.
10. Make the level of automation adaptable.
11. Design clear transitions between the different levels.
12. Focus on UX from the early stages of algorithmic research.

ADAPTABLE AI EVALUATION CANVAS

	Info Acquisition	Info Analysis	Decision Selection	Action Implementation
Automation Levels and Interactions				
AI Capabilities				

- Explain the purpose of the AI.
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- Design clear transitions between the different levels of automation.
- Focus on UX from the early stages of algorithmic research.

Navigation

Pop Groups Navigation

Flip Target

Fader Flip OFF

Overview

Tags & Pops

Bus Setup

Meter Bridge

Inputs 1-96

IN 1-8	IN 9-16	IN 17-24	IN 25-32
IN 33-40	IN 41-48	IN 49-56	IN 57-64
IN 65-72	IN 73-80	IN 81-88	IN 89-96

VCA 1-12

VCA 1	VCA 2	VCA 3	VCA 4
VCA 5	VCA 6	VCA 7	VCA 8
VCA 9	VCA 10	VCA 11	VCA 12

Auxes 1-24

Aux 1	Aux 2	Aux 3	Aux 4	Aux 5	Aux 6	Aux 7	Aux 8
Aux 9	Aux 10	Aux 11	Aux 12	Aux 13	Aux 14	Aux 15	Aux 16
Aux 17	Aux 18	Aux 19	Aux 20	Aux 21	Aux 22	Aux 23	Aux 24

Guitar

Configuration

Equaliser

Gate

Compressor

Effects

Sends

HPF Bass Lo Mid Hi Mid Treble LPF Phase

GAIN: 4.3 dB | FREQ: 210 Hz | WIDTH: 2.6

SHAPE: Bell | FLATTEN: ON | EQUALISER: ON

Aux 13

Configuration

Equaliser

Compressor

Effects

Contributors

Sends

Configuration Linking & Stereo Patching Direct Input Options Oscill

Bus Level: 0.0 ms

TRIM: 0.0 dB

Delay: 0.0 ms

Config: 0.0 ms

Main Bus: Send Pans Follow, Stereo Bus

MONO LEVEL: -inf dB

GROUP MODE: ON

FLEXI AUX: ON

Mono Bus: Mono Bus

SIS

CHANNEL AI

In 01

Guitar

CHANNEL PROFILES

Profile

1

2

Spill Conf.

Guitar

Auto Name Auto Setup

EQ SUGGESTIONS

Flat

Corrective

Warm

Smooth

Tight

Aggressive

Bright

Apply

In 01 Guitar	In 02 Kick	In 03 Kick	In 04 Piano	In 05 Vocals	In 06 Hihat	In 07 Bass	In 08 Snare	In 09 In 9	In 10 In 10	In 11 In 11	In 12 In 12	In 13 In 13	In 14 In 14	In 15 In 15	In 16 In 16
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- HOME
- Channel View
- Console View
- Manchino
- Automation
- Navigation
- Patching
- Groups
- Naming
- Flip
- MCA Flip
- Virtual Sound
- No show is currently open
- MENU

Navigation

Pop Groups Navigation

Flip Target

Fader Flip OFF

- Overview
- Tags & Pops
- Bus Setup
- Meter Bridge

Inputs 1-96 Inputs 97-144 Auxes 1-96 Matrices & Masters

IN 1-8 IN 9-16 IN 17-24 IN 25-32

IN 33-40 IN 41-48 IN 49-56 IN 57-64

IN 65-72 IN 73-80 IN 81-88 IN 89-96

VCA 1-12 VCA 13-24 Pops 1-12 Po

VCA 1 VCA 2 VCA 3 VCA 4

VCA 5 VCA 6 VCA 7 VCA 8

VCA 9 VCA 10 VCA 11 VCA 12

Auxes 1-24 Auxes 25-48 Auxes 49-72 Auxes 73-96 Mat

Aux 1 Aux 2 Aux 3 Aux 4 Aux 5 Aux 6 Aux 7 Aux 8

Aux 9 Aux 10 Aux 11 Aux 12 Aux 13 Aux 14 Aux 15 Aux 16

Aux 17 Aux 18 Aux 19 Aux 20 Aux 21 Aux 22 Aux 23 Aux 24

MAIN WORKFLOW

In 01

Configuration

Equaliser

Gate

Compressor

Effects

Sends

HPF Bass Lo Mid Hi Mid Treble LPF Phase

GAIN: 4.3 dB FREQ: 210 Hz WIDTH: 2.6

SHAPE: Bell FLATTEN: ON EQUALISER: ON

Configuration

Equaliser

Compressor

Effects

Contributors

Sends

Configuration Linking & Stereo Patching Direct Input Options Oscill

Bus Level: 20

Talk: ON

DELAY: 0.0 ms

Config: 0.0 ms

TRIM: 0.0 dB

Main Bus: Send Pans Follow Stereo Bus

MONO LEVEL: -inf dB

GROUP MODE: ON FLEXI AUX: ON

Mono Bus: Mono Bus Solo B: Solo B SIS: SIS

- In 01 Guitar
- In 02 Kick
- In 03 Kick
- In 04 Piano
- In 05 Vocals
- In 06 Hi-hat
- In 07 Bass
- In 08 Snare
- In 09 In 9
- In 10 In 10
- In 11 In 11
- In 12 In 12
- In 13 In 13
- In 14 In 14
- In 15 In 15
- In 16 In 16

CHANNEL AI

In 01 Guitar

CHANNEL PROFILES

Profile

1

2

Spill Conf.

Guitar

AI

SUGGESTIONS

Flat

Corrective

Warm

Smooth

Tight

Aggressive

Bright

Apply



Purpose

- ❑ Explain the purpose of the AI.
- ❑ Make clear what the system can do and how well it can do it.
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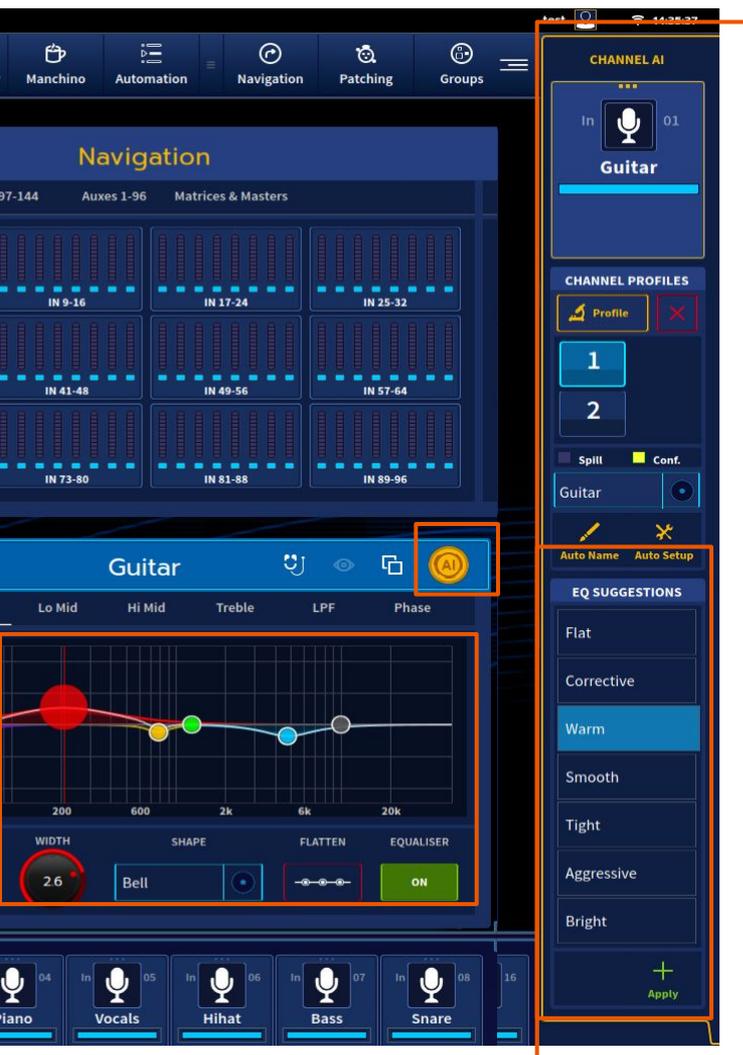


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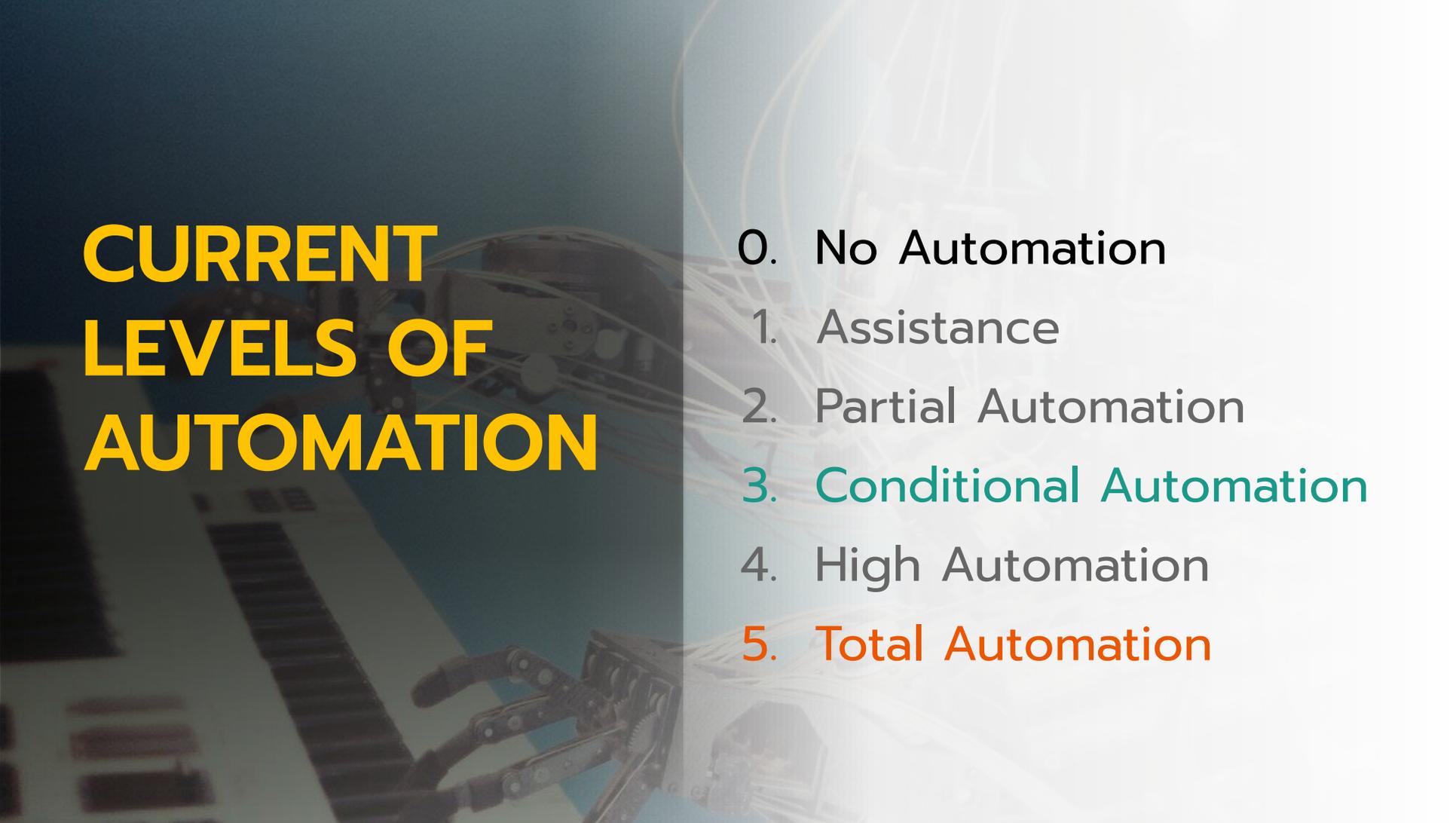


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CURRENT LEVELS OF AUTOMATION

0. No Automation
1. Assistance
2. Partial Automation
3. Conditional Automation
4. High Automation
5. Total Automation

Channel AI: Current System Evaluation

	Info Acquisition	Info Analysis	Decision Selection	Action Implementation
Automation Levels and Interactions	<p>0 - Channel selection</p> <p>0 - Profile creation</p>	<p>5 - Feature Extraction</p> <p>5 - Noise Detection</p> <p>5 - Quality Assessment</p> <p>3 - Instrument Detection</p> <p>3 - Audio Analysis</p>	<p>3 - Channel name</p> <p>3 - Setting selection</p> <p>3 - Setting generation</p> <p>0 - Profile selection</p> <p>0 - Profile retention</p>	<p>0 - Name Channel</p> <p>0 - Invoke autoseup</p> <p>0 - Audition Settings</p> <p>0 - Apply setting</p> <p>0 - Override settings</p>

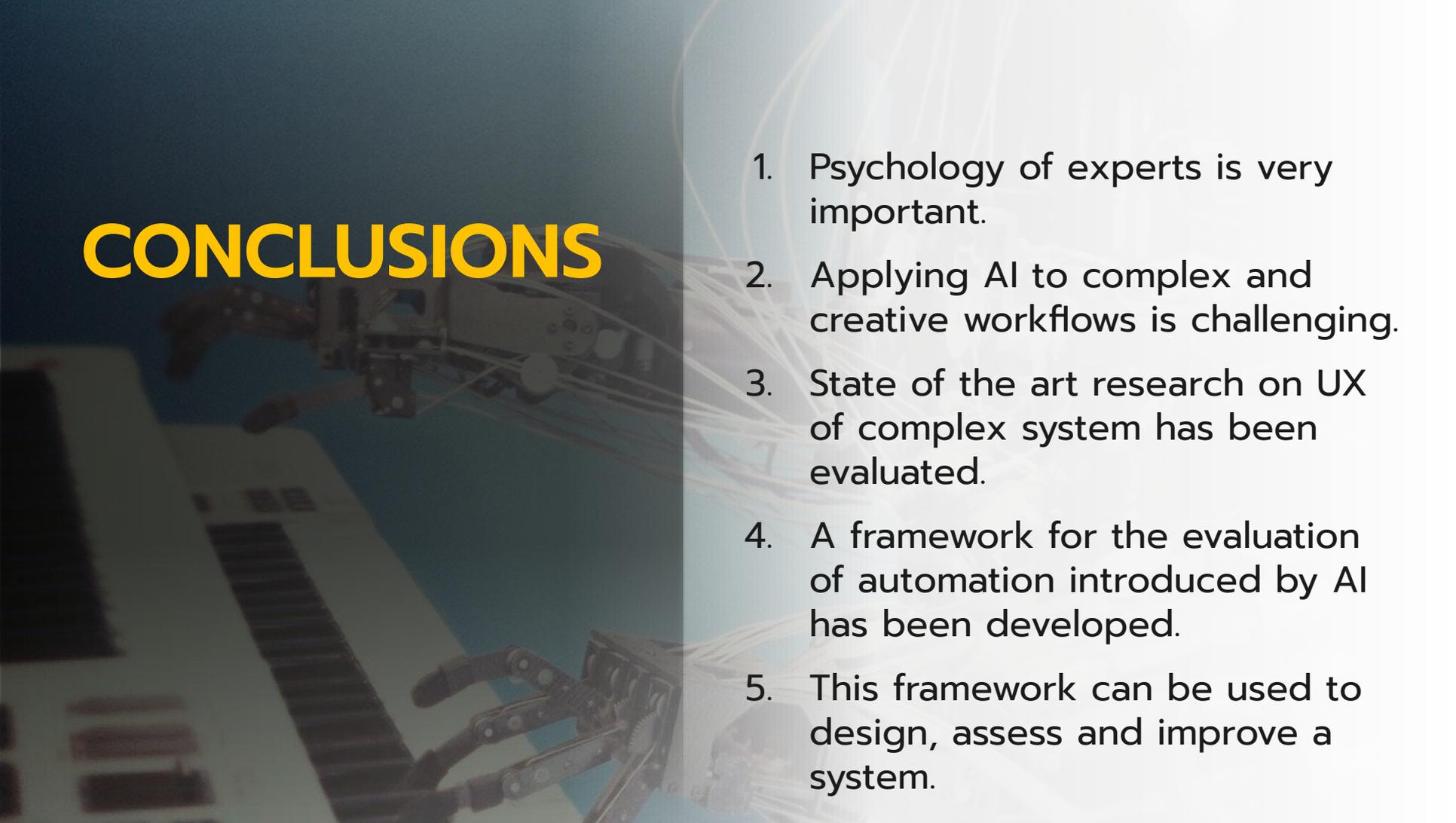
AI Capabilities		<p>Bayesian Inference</p> <p>Instrument Detection</p> <p>Unsupervised audio analysis</p>	<p>Settings generation</p> <p>Channels comparison</p>	
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Channel AI: Possible Evolution

	Info Acquisition	Info Analysis	Decision Selection	Action Implementation
Automation Levels and Interactions	5 - Room Profiling	5 - Feature Extraction	5 - Sets Personalization	3 - Auto Correction
	5 - Dynamic Profiling	5 - Noise Detection	3 - Channel name	0 - Name Channel
	0 - Channel selection	5 - Quality Assessment	3 - Setting selection	0 - Invoke autoseup
	0 - Profile creation	3 - Instrument Detection	3 - Setting generation	0 - Audition Settings
		3 - Audio Analysis	0 - Profile selection	0 - Apply setting
			0 - Profile retention	0 - Override settings

AI Capabilities	Deviation Tracking	Bayesian Inference	Reinforcement Learning	Correction trigger
	Environment Sensing	Instrument Detection	Settings generation	
		Unsupervised audio analysis	Channels comparison	

CONCLUSIONS

The background of the slide features a robotic hand with multiple fingers typing on a white keyboard. The scene is set against a dark blue background with several white, glowing light trails that curve across the right side of the image, suggesting motion or data flow.

1. Psychology of experts is very important.
2. Applying AI to complex and creative workflows is challenging.
3. State of the art research on UX of complex system has been evaluated.
4. A framework for the evaluation of automation introduced by AI has been developed.
5. This framework can be used to design, assess and improve a system.

Alex Palladini



@alexpalladini



alexpalladini

Mozart in the box: Interacting with AI tools for music creation

[Alessandro Palladini](#) (Music Tribe)

1:45pm–2:25pm Thursday, September 12, 2019

Location: LL21 C/D

[Interacting with AI](#)

RATE THIS SESSION