

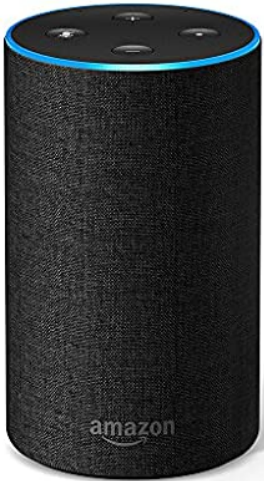
Interacting with AI

Human Computer Interaction

Fulvio Corno, Luigi De Russis

Academic Year 2019/2020

AI is everywhere!

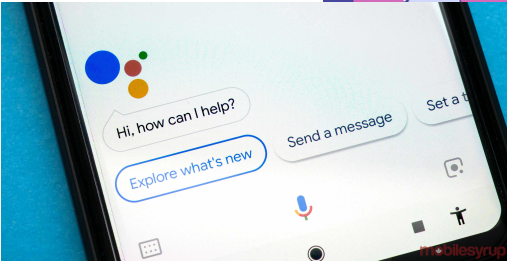


Chapter 1
What is AI?

Section	Exercises
I. How should we define AI?	1/1
II. Related fields	0/2
III. Philosophy of AI	0/1

Chapter 2
AI problem solving

Section	Exercises
I. Search and problem solving	0/1
II. Solving problems with AI	0/1
III. Search and games	0/1



Chapter 5
Neural networks

Section	Exercises	Section	Exercises
I. Neural network basics	0/1	I. About predicting the future	0/1
II. How neural networks are built	0/2	II. The societal implications of AI	0/1
III. Advanced neural network techniques	0/4	III. Summary	0/1

Create ML File Edit View Window Help

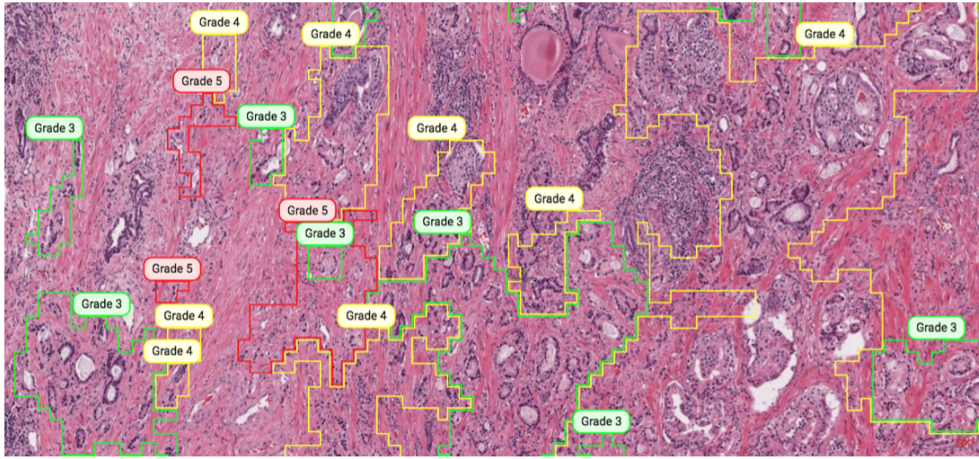
Project	Input	Accuracy	
AnimalClassifier	12	100%	97%
Model Sources	Classes	Training	Validation

AnimalClassifier

Drag or Add Files

Select File to Preview Output

Training completed after 32 seconds — today at 1:12 AM



Size 181 KB
Model Name AnimalClassifier
Author John Applesped
License License
Description A machine learning model that has been trained on a dataset of safari animals.



What is Different in Interactive AI Systems?

- AI-based systems are typically performed under **uncertainty**
 - often producing false positives and false negatives
- They may demonstrate unpredictable behaviors that can be *disruptive, confusing, offensive*, and even *dangerous* for users



What is Different in Interactive AI Systems?

- AI-based systems can also violate established usability guidelines of traditional user interface design
 - for instance: consistency or error prevention
- Many AI components are inherently **inconsistent**
 - they may respond differently to the same text input over time (e.g., autocompletion systems suggesting different words after language model updates)
 - or behave differently from one user to the next (e.g., search engines returning different results due to personalization)

How Can Design Interactive AI Systems?

- By following a human-centered process
 - in contrast to a data- or feature-oriented process
- Deciding when "to AI" and when "not to AI"
- Understanding when to automate (i.e., replace the user) and when to augment users' capabilities
- Balancing the uncertainty of AI systems with proper expectations and feedback

Guidelines for Human-AI Interaction

INITIALLY

- 1 INITIALLY**: Make clear what the system can do. Help the users understand what the AI system is capable of doing.
- 2 INITIALLY**: Make clear how well the system can do what it can do. Help the user understand how often the AI system may make mistakes.

DURING INTERACTION

- 3 DURING INTERACTION**: Time services based on context. Time when to act or interrupt based on the user's current task and environment.
- 4 DURING INTERACTION**: Show contextually relevant information. Display information relevant to the user's current task and environment.
- 5 DURING INTERACTION**: Match relevant social norms. Ensure the experience is delivered in a way that users would expect, given their social and cultural context.
- 6 DURING INTERACTION**: Mitigate social biases. Ensure the AI system's language and behaviors do not reinforce undesirable and unfair stereotypes and biases.

WHEN WRONG

- 7 WHEN WRONG**: Support efficient invocation. Make it easy to invoke or request the AI system's services when needed.
- 8 WHEN WRONG**: Support efficient dismissal. Make it easy to dismiss or ignore undesired system services.
- 9 WHEN WRONG**: Support efficient correction. Make it easy to edit, refine, or recover when the AI system is wrong.
- 10 WHEN WRONG**: Scope services when in doubt. Engage in disambiguation or gracefully degrade the AI system's services when uncertain about a user's goals.
- 11 WHEN WRONG**: Make clear why the system did what it did. Enable the user to access an explanation of why the AI system behaved as it did.

OVER TIME

- 12 OVER TIME**: Remember recent interactions. Maintain short-term memory and allow the user to make efficient references to that memory.
- 13 OVER TIME**: Learn from user behavior. Personalize the user's experience by learning from their actions over time.
- 14 OVER TIME**: Update and adapt cautiously. Limit disruptive changes when updating and adapting the AI system's behaviors.
- 15 OVER TIME**: Encourage granular feedback. Enable the user to provide feedback indicating their preferences during regular interaction with the AI system.
- 16 OVER TIME**: Convey the consequences of user actions. Immediately update or convey how user actions will impact future behaviors of the AI system.
- 17 OVER TIME**: Provide global controls. Allow the user to globally customize what the AI system monitors and how it behaves.
- 18 OVER TIME**: Notify users about changes. Warn the user when the AI system adds or updates its capabilities.

The Guidelines for Human-AI Interaction will help you create AI systems and features that are human-centered. We hope you use them throughout your design process – as you evaluate existing ideas, brainstorm new ones, and collaborate with the multiple perspectives involved in creating AI.

These guidelines synthesize more than 20 years of thinking and research in human-AI interaction. Learn more: <https://aka.ms/aiguideines>.



By Microsoft Research: <https://www.microsoft.com/en-us/research/project/guidelines-for-human-ai-interaction/>

2

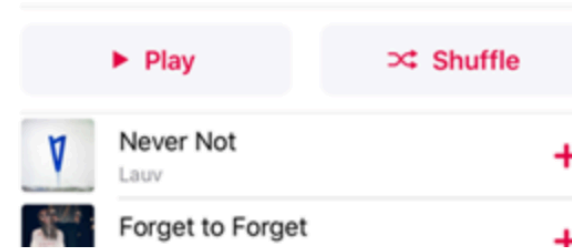
INITIALLY

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

Help the user understand how often the AI system may make mistakes.

EXAMPLE IN PRACTICE

Discover new music from artists we think you'll like.
Refreshed every Friday.



The recommender in **Apple Music** uses language such as "we think you'll like" to communicate uncertainty.

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

2

6

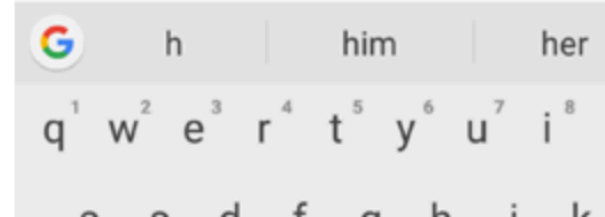
DURING INTERACTION

Mitigate social biases.

Ensure the AI system's language and behaviors do not reinforce undesirable and unfair stereotypes and biases.

EXAMPLE IN PRACTICE

Do you want to meet h



The predictive keyboard for **Android** suggests both genders when typing a pronoun starting with the letter "h."

Mitigate social biases.

6

9

WHEN WRONG

Support efficient correction.

Make it easy to edit, refine, or recover when the AI system is wrong.

EXAMPLE IN PRACTICE

All

Images

Videos

Maps

757,000 Results

Any time ▾

Including results for **keanu reeves**.
Do you want results only for **keanu reaves**?

When **Bing** automatically corrects spelling errors in search queries, it provides the option to revert to the query as originally typed with one click.

Support efficient correction.

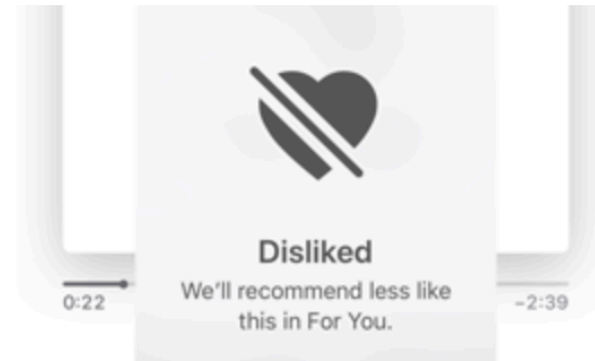
9

16
OVER TIME

Convey the consequences of user actions.

Immediately update or convey how user actions will impact future behaviors of the AI system.

EXAMPLE IN PRACTICE



Upon tapping the like/dislike button for each recommendation in **Apple Music**, a pop-up informs the user that they'll receive more/fewer similar recommendations.

Convey the consequences of user actions.

16



Amazon Echo

Hands-On and Exercise

Applying the Human-AI Guidelines...

- <https://docs.google.com/spreadsheets/d/1DAz8fR5DWTpxZ-5r6y7QE5qrqBdC9-fkYdHYsRpKGUk/>

STAGE	GUIDELINE	DESCRIPTION
INITIALLY	1 Make clear what the system can do.	Help the user understand what the AI system is capable of doing.
	2 Make clear how well the system can do what it can do.	Help the user understand how often the AI system may make mistakes.
DURING INTERACTION	3 Time services based on context.	Time when to act or interrupt based on the user's current task and environment.
	4 Show contextually relevant information.	Display information relevant to the user's current task and environment.
	5 Match relevant	Ensure the experience is delivered in a way that users

Other Guidelines and References

- Google's People+AI Guidebook: <https://pair.withgoogle.com/guidebook/>
- Apple's Human Interface Guidelines for Machine Learning: <https://developer.apple.com/design/human-interface-guidelines/machine-learning/>
- Human-AI Guidelines - Interactive cards with examples in practice: <https://aidemos.microsoft.com/guidelines-for-human-ai-interaction/demo>

License

- These slides are distributed under a Creative Commons license “**Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)**”
- **You are free to:**
 - **Share** — copy and redistribute the material in any medium or format
 - **Adapt** — remix, transform, and build upon the material
 - The licensor cannot revoke these freedoms as long as you follow the license terms.
- **Under the following terms:**
 - **Attribution** — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
 - **NonCommercial** — You may not use the material for [commercial purposes](#).
 - **ShareAlike** — If you remix, transform, or build upon the material, you must distribute your contributions under the [same license](#) as the original.
 - **No additional restrictions** — You may not apply legal terms or [technological measures](#) that legally restrict others from doing anything the license permits.
- <https://creativecommons.org/licenses/by-nc-sa/4.0/>

