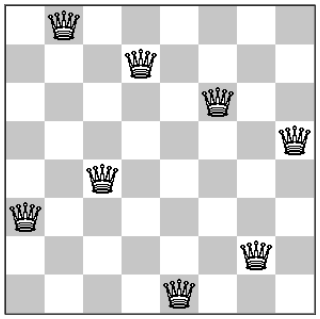
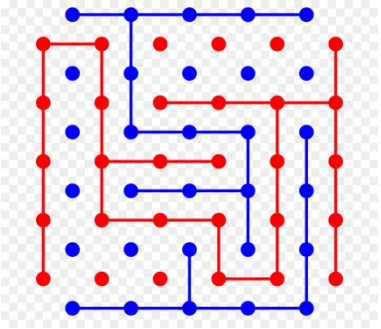
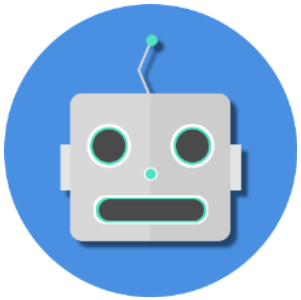
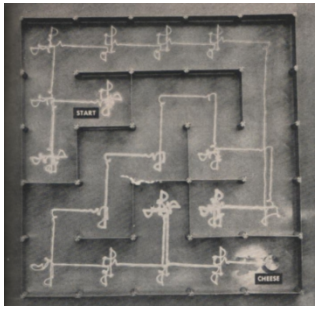
GE2340 Artificial Intelligence

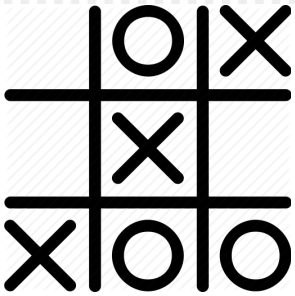
AI Chatbot and its Case Studies

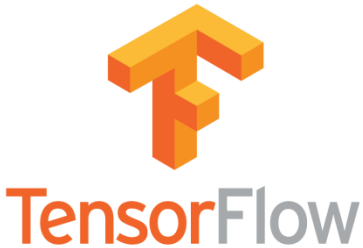












Chee Wei Tan

Challenges of Artificial Intelligence

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Skype?!

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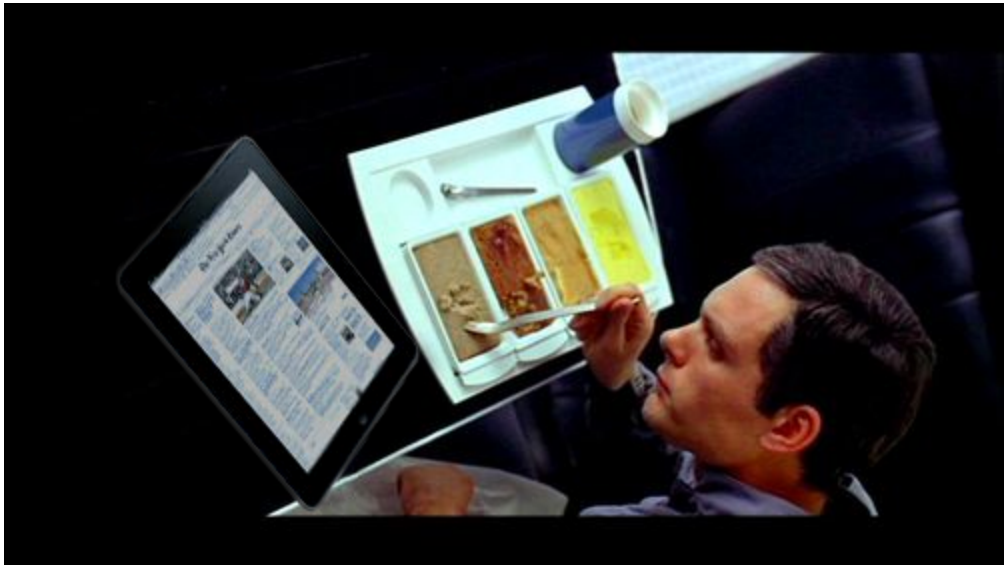
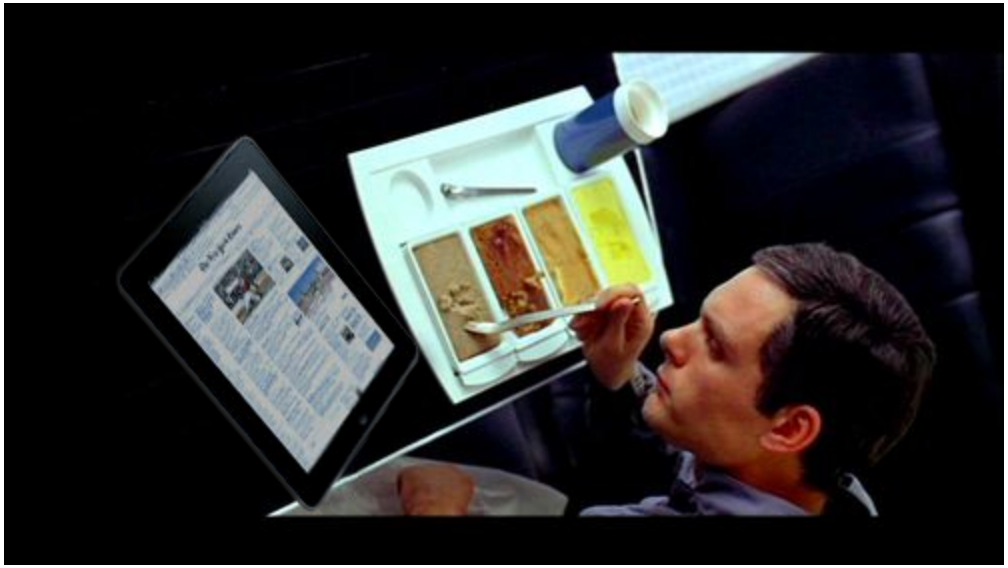


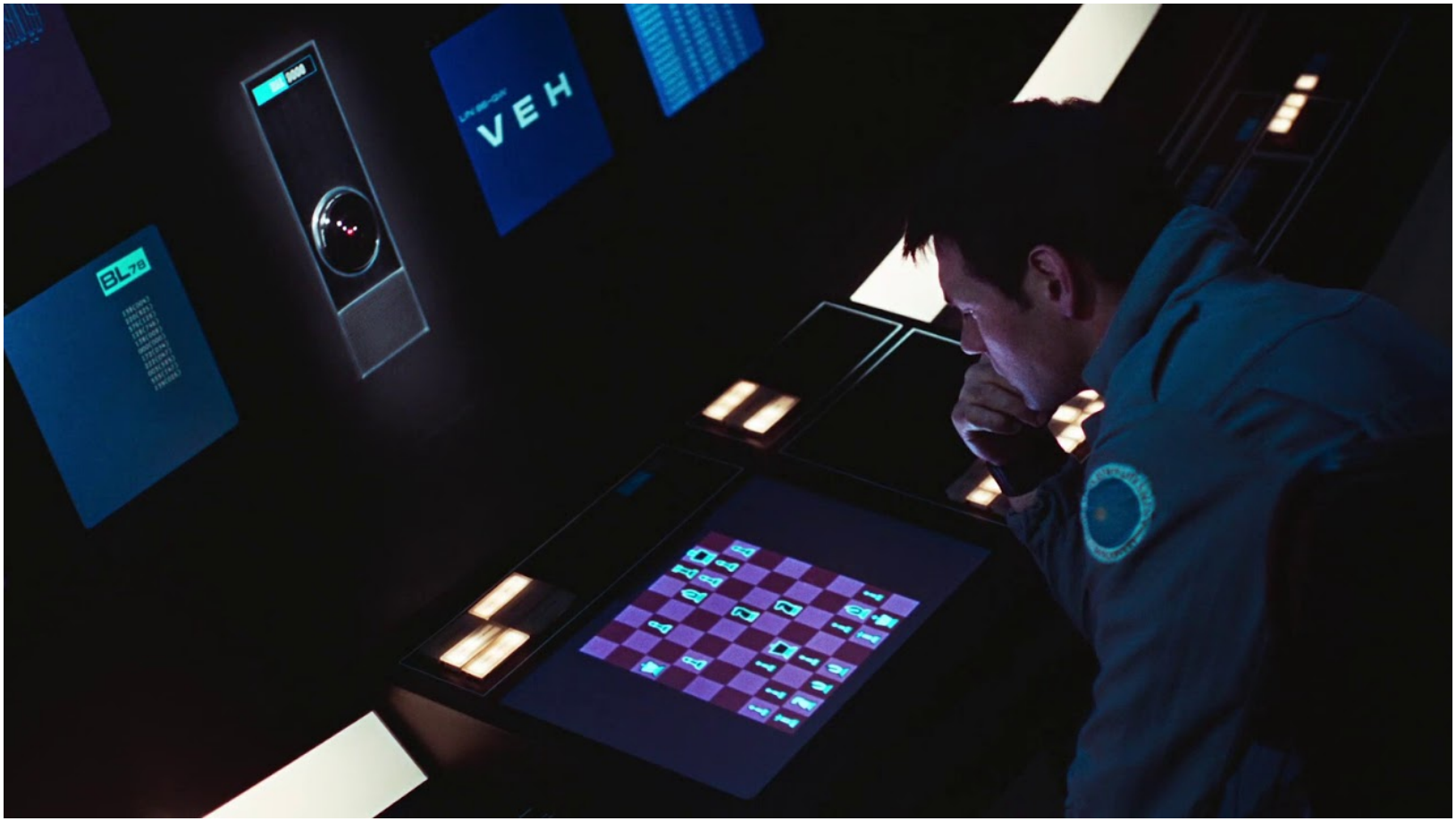
Challenges of Artificial Intelligence

Skype?!

iPad?!



Challenges of Artificial Intelligence

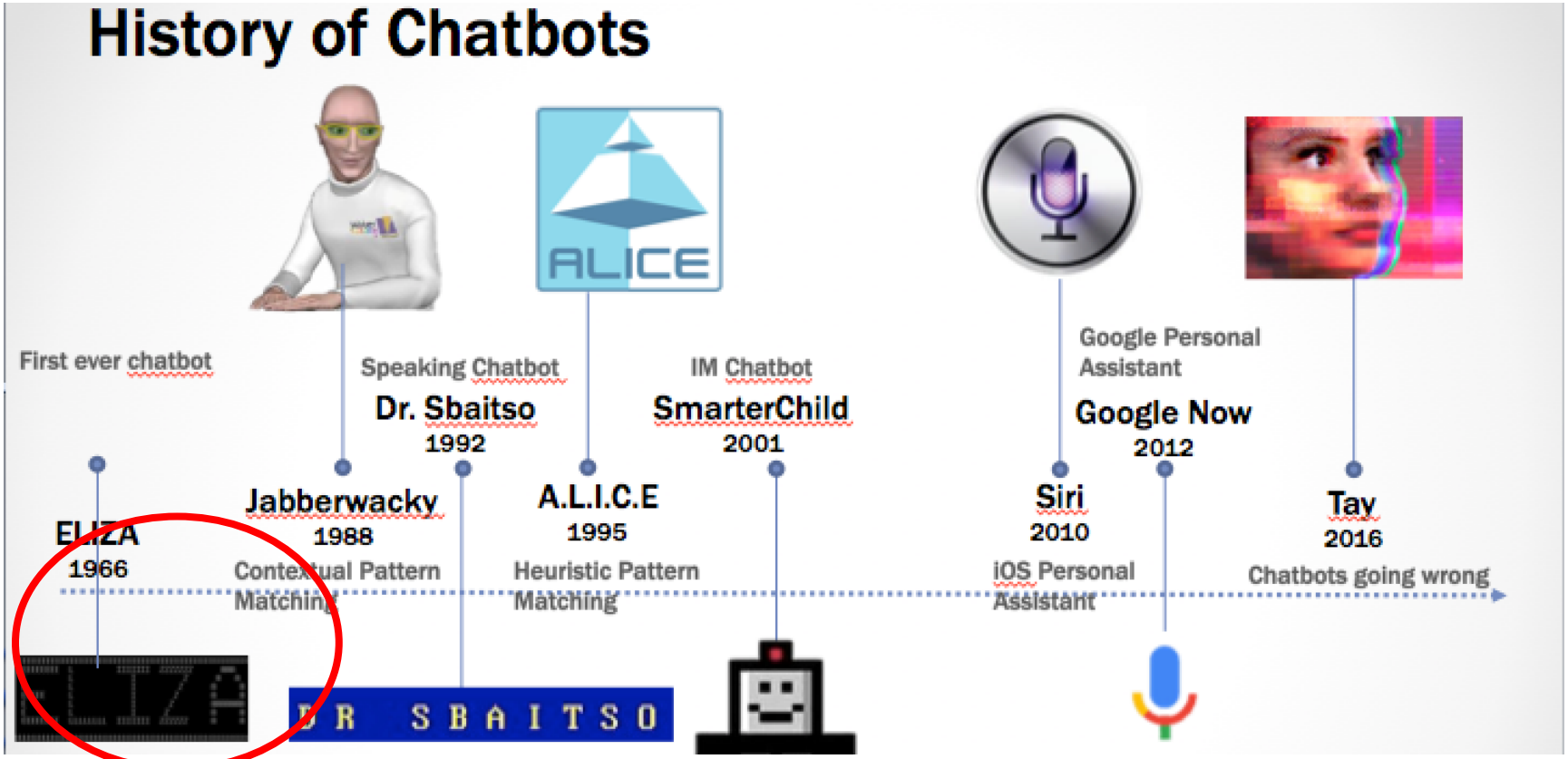


A Game of Chess against AI

"You sit at the board and suddenly your heart leaps. Your hand trembles to pick up the piece and move it. But what chess teaches you is that you must sit there calmly and think about whether it's really a good idea and whether there are other, better ideas." – Stanley Kubrick
http://www.chessmaniac.com/stanley-kubrick-and-chess

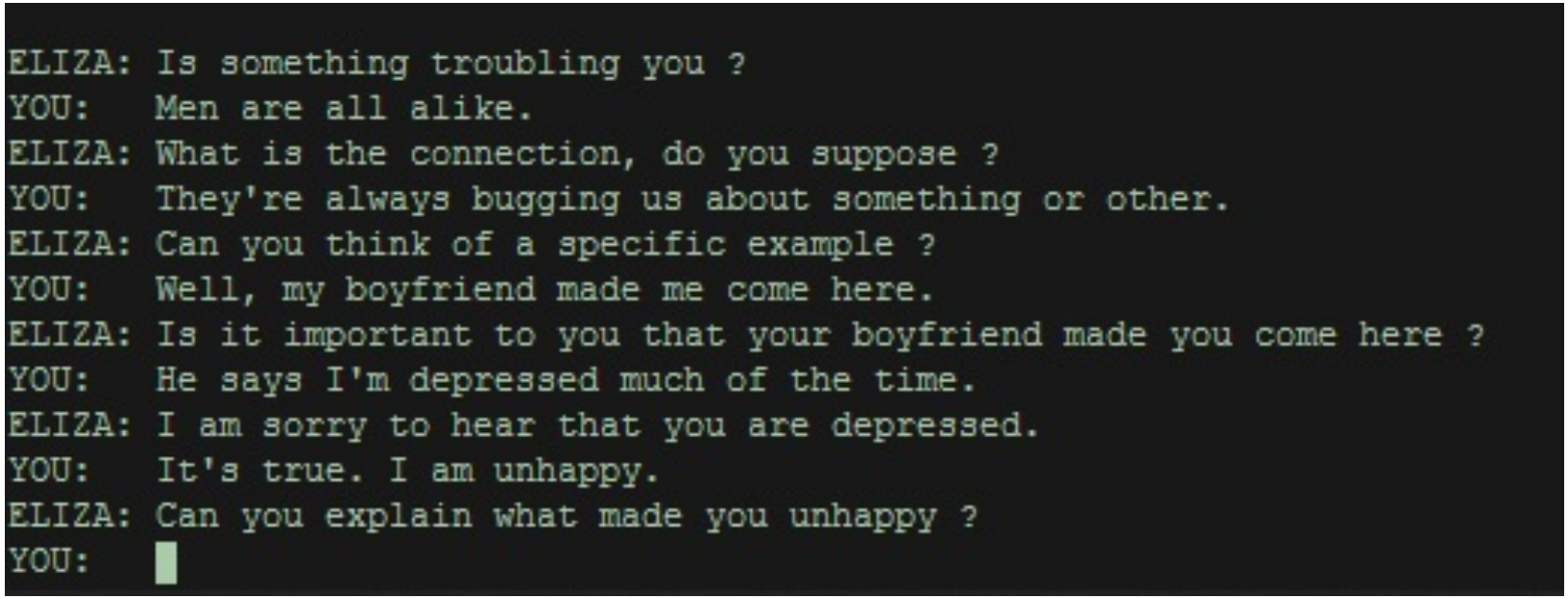
Eliza Chatbot

ELIZA is an early natural language processing computer program created from 1964 to 1966 at the MIT Artificial Intelligence Laboratory by Joseph Weizenbaum.



Eliza Chatbot(cont'd)

Demonstrated the superficiality of communication between humans and machines, in which Eliza *simulated conversation* by using a 'pattern matching' and substitution methodology that gave users an illusion of understanding, but cannot contextualize events.



Sofia Math Chat Robot

The goal of "Sofia Math Chat Robot“ project was to gain insight into the mechanisms of teaching and learning by playing and experimentation with computer algebra systems.

```
sofia "how are you"
sofia "compute the derivative of sin(10*x)"
sofia "find the critical points under constraint of 13-4*x+x^2-6*y+y^2+z^2 and z^2-x^2-2*y^2"
sofia "find lagrange solution x^2+y^2+y and  4x-5x^2-y^2-3*y-3"
sofia "what is a determinant"
sofia "add three and four and seven"
sofia "add million thousand hundred fifteen"
sofia "compute PrimeQ[33]"
sofia "compute Det[{{3,4,1},{32,4,1},{1,2,3}}]"
sofia "what is an integral"
sofia "compute the number of partitions of 10"
sofia "what is the weather"
sofia "learn [Switzerland] Country in the center of europe."
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http://www.math.harvard.edu/~knill/sofia/

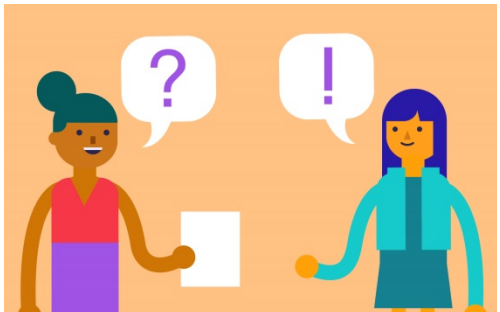
Sofia Math Chat Robot (cont'd)

- When people talk about mathematics, there is always a background context, which makes it clear, what object one is talking about and on which level the communication takes place. The discussion partners do have common knowledge, common pictures in their mind and can be ambiguous in the statements. For example, the definition of an "isomorphism" can occur in different contexts

- People usually adapt automatically to the context. Adapting the level of understanding and to gauge what students already know or do not know is maybe a common challenge faced by a teacher in class

- Context problem will be invisible to the user who talks to Sofia: the context evolves with past conversation. The longer the chat is, the better Sofia can gauge context and reply intelligently

http://www.math.harvard.edu/~knill/sofia/



Apple Siri

- Apple Siri chatbot is a virtual assistant software that enables Apple device users to communicate by voice to perform tasks (e.g., call a number in address book, weather forecasting, set reminders), debut in 2011
- Users receive audible replies from Siri and the software adapts to the language used, search history, and user preferences with sufficient data
- Apple's first digital personal assistant "Knowledge Navigator" was proposed by John Sculley in 1987

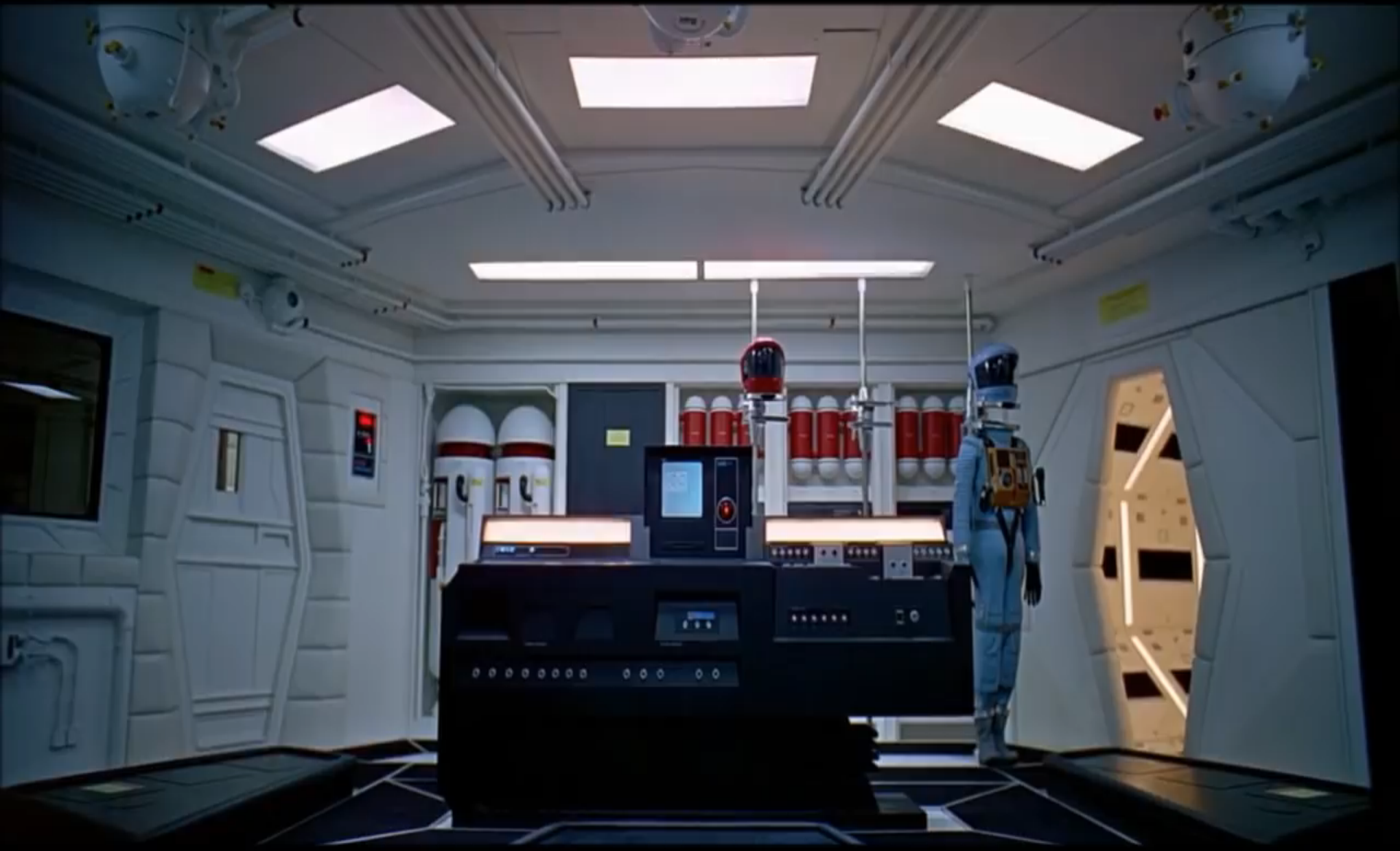
Amazon Lex

- Speech recognition and natural language processing are challenging problems to solve in computer science, requiring sophisticated machine learning algorithms and massive amounts of data
- Amazon Lex (https://aws.amazon.com/lex) is a service for building conversational interfaces into any application using voice and text.
- Amazon Lex provides deep learning to automatic speech recognition, converting speech to text, and natural language understanding, enabling user to build applications with highly engaging user experiences and conversational interactions.

Amazon Lex (cont'd)

- Amazon Lex put the power of deep learning and natural language processing into software API that integrates with new categories of products through conversational interfaces.

Amazon Lex can be used to build chatbots for everyday consumer requests, such as accessing the latest news updates, game scores, or weather. After you build your Amazon Lex bot, you can deploy them on mobile devices with support for rich message formatting.



"2001: A Space Odyssey" (1968), Stanley Kubrick

Year

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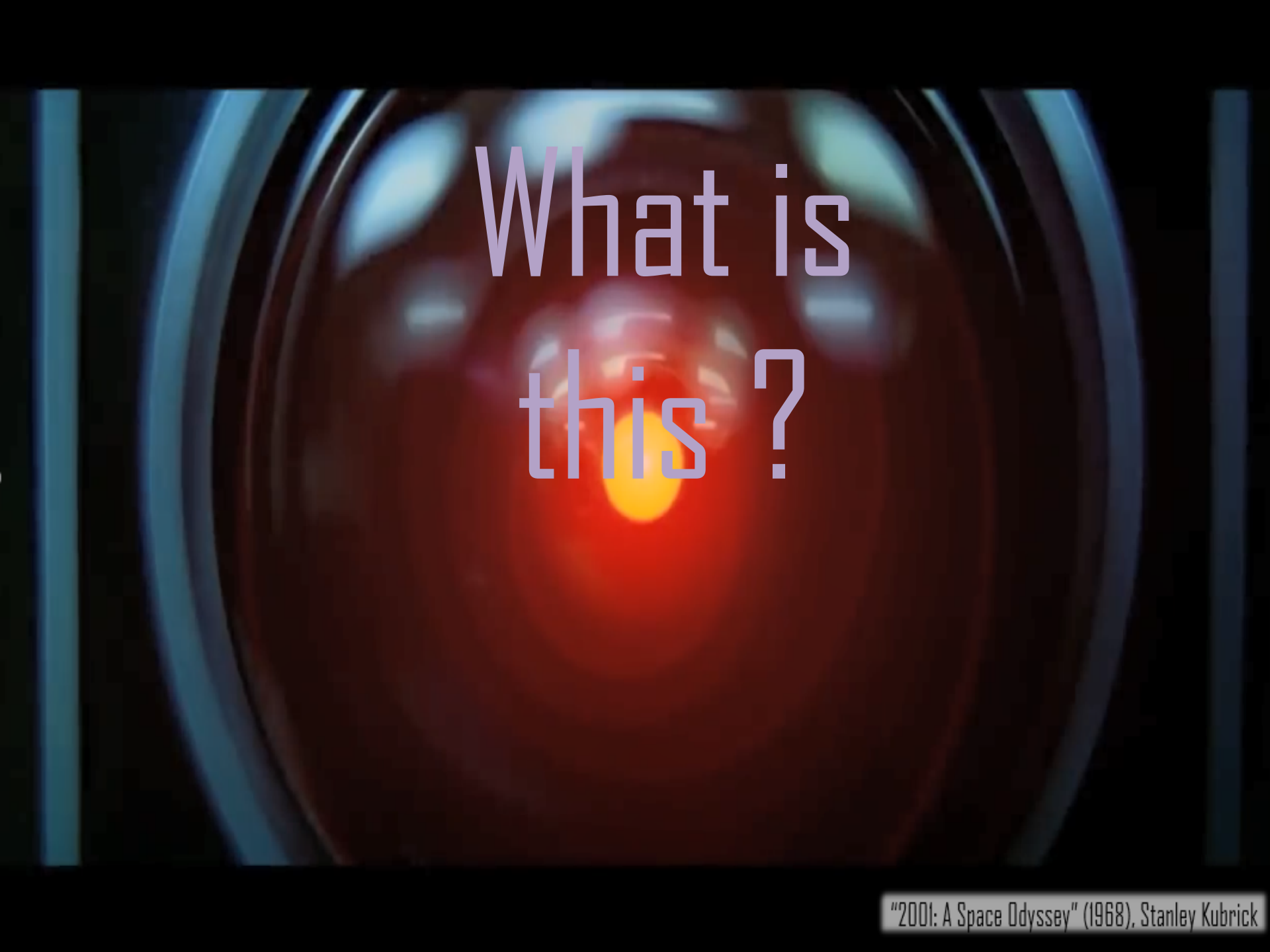
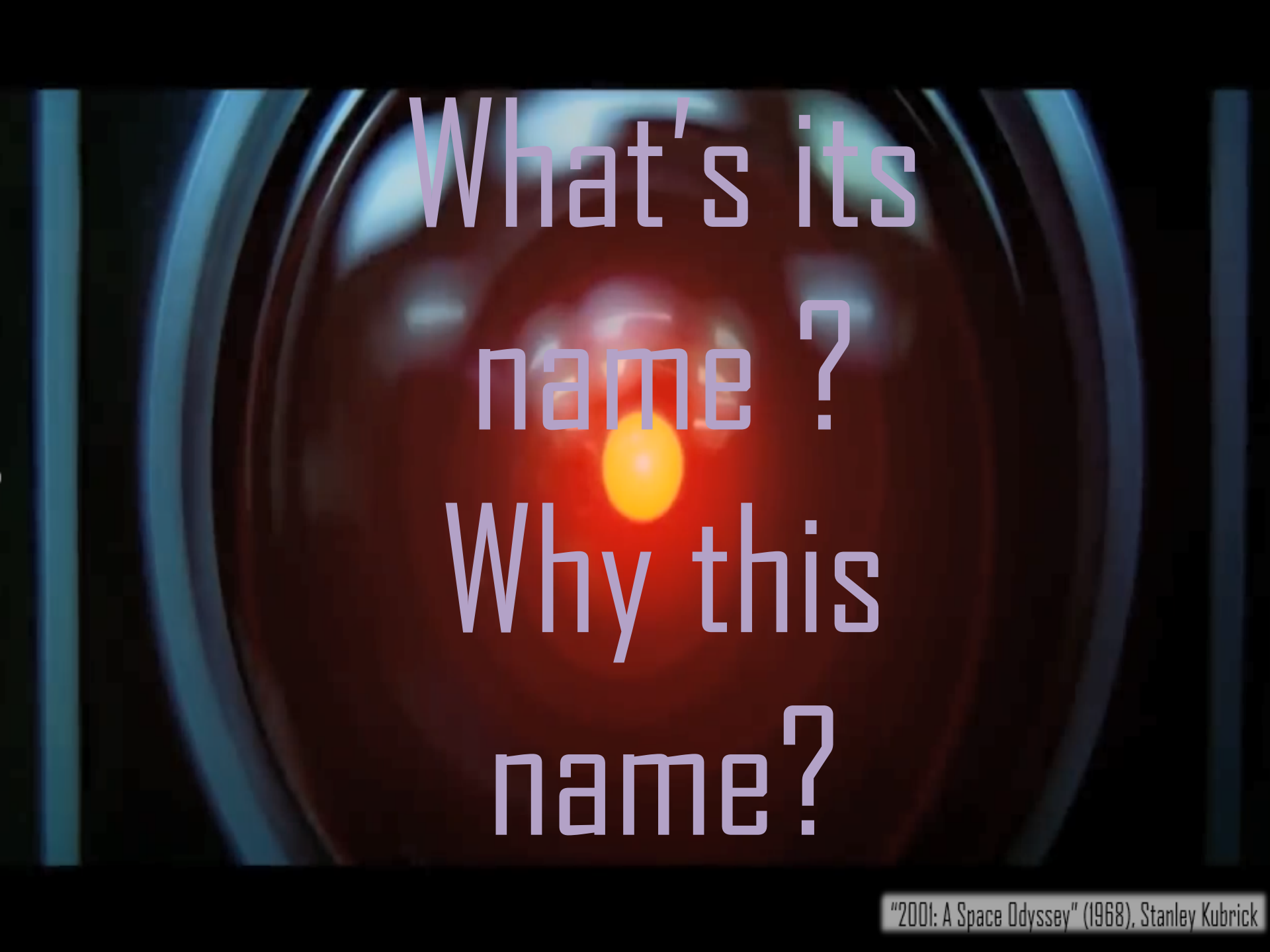
"2001: A Space Odyssey" (1968),
Stanley Kubrick



"2001: A Space Odyssey" (1968), Stanley Kubrick



"2001: A Space Odyssey" (1968), Stanley Kubrick

AI in the Era of COVID-19