

## **Problem Set 1: Artificial Intelligence**

### **1) Introduction, history**

Read Turing's original paper (Turing, 1950 - available on the course web site). In the paper, Turing discusses several potential objections to his test for intelligence. Which objections still carry some weight? Are his refutations valid? Can you think of new objections arising from developments since he wrote the paper? In the paper, he predicts that by the year 2000, a computer will have a 30% chance of passing a five-minute Turing Test with an unskilled interrogator. What chance do you think a computer would have today? Provide some justification for your answers.

Briefly survey the current state-of-the-art natural language understanding systems. This could include chatbots, question/answering systems, and speech recognition systems. What are the systems strengths and weaknesses? What obstacles remain and what components are needed to develop a natural language understanding system that can reliably carry on a conversation with a system, i.e., truly pass the Turing Test!

Chatbots:

<https://chatbotslife.com/ultimate-guide-to-leveraging-nlp-machine-learning-for-you-chatbot-531ff2dd870c>

Every year the Loebner prize is awarded to the program that comes closest to passing a version of the Turing test. Research and report on the latest winner of the Loebner prize: <http://www.loebner.net/Prizef/loebner-prize.html>

SQuAD Question/Answering

<https://rajpurkar.github.io/SQuAD-explorer/>

Chat bots

Max: 1-page.

### **2) AI Grand Challenge Topics**

Visit the [aaai.org](http://www.aaai.org) Grand Challenges Web site and select an AI Topic that you find interesting and that you believe provides a Grand Challenge problem (see criteria below):

<http://www.engineeringchallenges.org/challenges.aspx>

<https://www.datanami.com/2018/03/13/jeff-dean-thinks-ai-can-solve-grand-challenges-heres-how/>

Justify your selected AI Topic by stating how well it satisfies the criteria for a Grand Challenge problem.

### **Grand Challenge Criteria**

- *Clear and compelling demonstration of cognition*

- Non-gameable proxy for a range of problems requiring cognitive capabilities
- *Clear and simple measurement*
  - Success is well-defined
- *Decomposable and diagnostic*
  - Partial results; failure should point to way to needed improvement
- *Ambitious and visionary, but not unrealistic*
  - Faith in success in 10 - 20 years
- *Compelling to the general public*
  - *Impact*
- *Motivating for the research community*
  - *Interesting line of research.*

Max: 1-page.

Submission:

Submit one PDF file with your name, class, and problem set number to Blackboard, and submit a paper version in class. See Blackboard for due dates.