Towards a Socio-culturally aware AI

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Microsoft Research
How long will it take for AI to surpass humans?

McKinsey Global Institute analysis

<table>
<thead>
<tr>
<th>Rating</th>
<th>Below median</th>
<th>Median</th>
<th>Top quartile</th>
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<tr>
<td>Sensory</td>
<td>Sensory perception</td>
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<td>Cognitive capabilities</td>
<td>Recognizing known patterns/categories</td>
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<td>Generating novel patterns/categories</td>
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<td>Logical reasoning/problem solving</td>
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<td>Optimization and planning</td>
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<td>Creativity</td>
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<td>Information retrieval</td>
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<td>Coordination with multiple agents</td>
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<td>Output articulation/presentation</td>
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<td>Natural language processing</td>
<td>Natural language generation</td>
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<td>Natural language understanding</td>
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<td>Social and emotional capabilities</td>
<td>Social and emotional sensing</td>
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<td>Social and emotional reasoning</td>
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<td>Social and emotional output</td>
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<td>Physical capabilities</td>
<td>Fine motor skills/dexterity</td>
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<td>Gross motor skills</td>
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<td>Navigation</td>
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<td>Mobility</td>
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2010 20 30 40 50 60 70 2080
Social Intelligence

- Social intelligence is the capability to effectively navigate and negotiate complex social relationships and environments.

- *The social intelligence hypothesis*: complex socialization such as politics, romance, family relationships, quarrels, and collaboration, (1) was the driving force in development of human brain and (2) today provides our ability to use those large brains in complex social circumstances.

- Language is directly related to social intelligence because we mainly use language to mediate our social relationships.
As Intelligent systems become more ubiquitous, they not only should be able to solve specific tasks, but also *behave in a socio-culturally appropriate manner.*
Approach

The 3-DEE model
As Intelligent systems become more ubiquitous, they not only should be able to solve specific tasks, but also behave in a socio-culturally appropriate manner.
The 3-DEE Approach to ASI

Discover

Evaluate

Design

Develop
Discover

• Identify the principles of socio-culturally appropriate behavior

• Encounters of 5 kinds
  1. Human ↔ Human
  2. Human ↔ Human-society
  3. Human ↔ Machine
  4. Machine ↔ Human-society
  5. Machine ↔ Machine
  6. Human-society ↔ Human Society
Methods and Data

• Studies in Ethnography and HCI
  • User studies with artefacts
  • User studies with Wizard-of-Oz
  • User studies through participant interview

• Large scale data-driven studies
  • Social Media – Twitter, Reddit, WeChat, Facebook, ....

Formal

Privacy Continuum

Informal

public
Designing and Developing ASI Systems

• Socio-cultural norms as hardcoded constraints
  • Separate style from content
  • E.g., Dialogue design and planning

• Social-cultural norms as emergent properties
  • Use of Machine learning
  • But remember what happened to Tay

• Fairness, Accountability, Transparency in ML
Designing and Developing ASI Systems

Who is the end-user?

Cultural continuum

- individual
- User-groups
- Cultural regions
- Countries
- Universal

Interacts with psychological and other demographic variables that cuts across the cultural plane.
Evaluation of ASI

- No task or goal to be accomplished.
- It’s all about user-experience
- Disentangling the ASI from other aspects of UX is a difficult problem
Christopher Potts is professor of linguistics and Computer Science, and director of the Center for the Study of Language and Information (CSLI), at Stanford. In his research, he uses computational methods to explore how emotion is expressed in language and how linguistic production and interpretation are influenced by the context of utterance. He is the author of the 2005 book *The Logic of Conventional Implicatures* as well as numerous scholarly papers in computational and theoretical linguistics. He received his PhD in linguistics from the University of California at Santa Cruz.
Daniel McDuff is a researcher at Microsoft and works on scalable tools to enable the automated recognition and analysis of emotions and physiology. He is also a visiting scientist at Brigham and Women’s Hospital in Boston. McDuff completed his PhD in the affective computing group at the MIT Media Lab in 2014 and has a BA and MS from Cambridge University. Previously, McDuff was director of research at Affectiva and a post-doctoral research affiliate at the MIT Media Lab. During his PhD, he built state-of-the-art facial expression recognition software and led the analysis of the world’s largest database of facial expression videos. His work has received nominations and awards from *Popular Science* magazine as one of the top inventions in 2011, South-by-South-West Interactive (SXSWi), The Webby Awards, ESOMAR, and the Center for Integrated Medicine and Innovative Technology (CIMIT). His projects have been reported in many publications including *The Times, The New York Times, The Wall Street Journal, BBC News, New Scientist*, and *Forbes* magazine. McDuff was named a 2015 WIRED Innovation Fellow and has spoken at TEDx Berlin.
Cristian Danescu-Niculescu-Mizil is an assistant professor in the information science department at Cornell University. His research aims at developing computational frameworks that can lead to a better understanding of human social behavior, specifically leveraging natural language datasets generated online. He is the recipient of several awards—including the WWW 2013 Best Paper Award, a CSCW 2017 Best Paper Award, and a Google Faculty Research Award—and his work has been featured in The New York Times, NPR’s All Things Considered and NBC’s The Today Show.
Thank you