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MACHINES À PARLER · TALKING MACHINES

CONVERSATION AND CREATION WITH ARTIFICIAL INTELLIGENCE

8 NOVEMBRE 2021 |
9h30 - 18h00
INSTITUT DE FRANCE,
SALLE HUGOT

TESaCo

ACADÉMIE DES SCIENCES MORALES ET POLITIQUES

CNR ISTC
ISTITUTO DI SCIENZE E TECNOLOGIE DELLA COGNIZIONE

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

TALKING MACHINES: CONVERSATION AND CREATION WITH ARTIFICIAL INTELLIGENCE

GPT-3, a cutting-edge artificial language model, has largely fueled the scientific debate about its promises and limitations. However, many questions remain open concerning not only the technical aspects but also the possible applications of «talking machines» in their uncanny ability to imitate and simulate human language.

This workshop aims to bring together scholars from several fields to discuss three types of questions raised by these artificial languages:

(1) the principles, perspectives and limits of artificial intelligence applied to language;
(2) the problem of the economic and material conditions of their conception and creation, including the role of public research in the development of very costly language models such as GPT-3;
(3) the uses of AI in conversation and creation, as well as in digital humanities.

The more promising these models are and the better the conversational agents simulate dialogical interaction with humans, the more pressing the questions they raise concerning social dynamics, emotional and affective reactions, and the identity status attached to these artificial intelligences.

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This symposium is co-organized by TESaCo, a project within Académie des sciences morales et politiques (Paris), ALMA IA-Research Institute for Human Centered Artificial Intelligence (Bologne) and ISTC-CNR (Rome).
Scientific coordination: Serena Ciranna & Daniel Andler
General organization and communication: Margaux Berrettoni

PROGRAMME

9h30	**Introduction** Daniel Andler
9h45	**Grounding symbols in model-theoretic and distributional semantics** Aldo Gangemi
10h20	**Extracting Musical Heritage Knowledge from text: the problem of relevant implicit knowledge and language evolution over time** Valentina Presutti
10h55	*Break*
11h10	**The Difference between Conversational Agents and Conversation** Justine Cassell
11h45	**Can AI help developmental science and vice versa?** Emmanuel Dupoux
12h20	**Roundtable I**
13h00	*Lunch break (everyone invited)*

14h00	**Introduction** Serena Ciranna
14h10	**Turing Tests: Writing With and Against AI** Jacqueline Feldman
14h55	**Zombie Creativity: the death and resurrection of the author in the age of AI** Joanna Walsh
15h30	**The linguistic competence of large language models** Raphaël Millière
16h05	*Break*
16h20	**Chatbots and humans, from the book of Genesis to the opinion of the French national digital ethics committee** Alexei Grinbaum
16h55	**Roundtable II**
18h00	*End*

Grounding symbols in model-theoretic and distributional semantics

Transformers and other sub-symbolic systems attempt to grasp meaning, e.g. out of sub-string ("language") or pixel models. Despite a chain of successful applications, mostly focusing on specific tasks, some general semantic abilities of biological organisms seem out of their reach: Broad Explainability, Embodied Cognition, Multi-modality, Multi-layering, Common Sense, Diachronicity, etc. The problems are shared, in different ways, with classical symbolic systems.
Some clarifications will be made about different grounding strategies, with a notable example from an ongoing project about applying Knowledge Graphs and AI to music and discourse about music.

Aldo Gangemi is full Professor at University of Bologna, and Director of the Institute for Cognitive Sciences and Technologies of the Italian National Research Council, where he has co-founded the Semantic Technology Lab (STLab) in 2008. His research focuses on Semantic Technologies as an integration of methods from Knowledge Engineering, Semantic Web, Linked Data, Cognitive Science, and Natural Language Processing. His theoretical interests concentrate upon the representation and discovery of knowledge patterns across data, ontologies, natural language, and cognition, using hybrid symbolic/sub-symbolic methods. Applications domains include Cultural Heritage, Robotics, Medicine, Law, eGovernment, Agriculture and Fishery, and Business. He has published more than 250 papers in international peer-reviewed journals, conferences and books (Scholar H-index=59), and seats as EiC or EB member of international journals (Semantic Web, Web Semantics, Applied Ontology), conference chair (EKAW2008, WWW2015, ESWC2018/9), has coordinated research teams in 8 EU projects, and is the scientific coordinator of the H2020 SPICE project. He is member of the Board of Directors at IMT School for Advanced Studies Lucca.

Extracting Musical Heritage Knowledge from text: the problem of relevant implicit knowledge and language evolution over time.

European musical heritage is a dynamic historical flow of experiences, leaving heterogeneous traces that are difficult to capture, connect, access, interpret, and valorise. One of the goals of the Polifonia project is to encode musical heritage knowledge that is hidden in texts in order to enhance the understanding of its identity, history and socio-cultural impact. This requires identifying and extracting lexical, social, cultural, and historical features from texts expressing discourses about music objects, over several centuries and languages. In my presentation, I will focus, through an example, on the challenges that this task pose to language technologies.

Valentina Presutti is an Associate Professor of Computer Science at the University of Bologna. She is also an Associate Researcher at the Institute of Cognitive Science and Technologies of CNR and coordinator of STLab. She received her Ph.D in Computer Science at the University of Bologna (2006). Her research interests include AI, Semantic Web and Linked Data, Knowledge Extraction, Empirical Semantics, Social Robotics, Ontology and Knowledge Engineering. She is the PI of Polifonia, a EU H2020 project (2021-2024) developing AI and semantic web methods for building a large scale knowledge graph of the European Musical Heritage. She has been responsible for several national and EU projects (e.g. MARIO, IKS, ArCo). During her post-doc she worked in NeOn (FP6 EU IP) and created ontologydesignpatterns.org and the series WOP, reference resources for semantic web researchers. She has +150 articles in international journals/conferences/workshops. She serves as editorial board member of J. of Web Semantics (Elsevier), Data Intelligence (MIT Press), JASIST (Wiley), Intelligenza Artificiale (IOS Press), and of «Semantic Web Studies» (IOS Press). She is co-director of International Semantic Web Research Summer School (ISWS) and has served in organisational and scientific roles for several events.

The Difference between Conversational Agents and Conversation

Trained on 500 billion words, with 175 billion parameters, GPT-3 is capable of achieving good performance on most automatic language processing tasks on the basis of only a few examples of the task at hand. Despite this impressive performance as a language model, GPT-3 remains deeply limited in its ability to generate text for dialogue or conversation. GPT-3 and other similar models, including those trained on dialogue data, fall down in (at least) one specific area - that I will argue is what makes conversation so important to us as human beings. That area is the use of conversation to knit social bonds and to effect social actions. As I will show, even putatively meaningless social chit-chat plays an important role in all of our interactions, in everything from increasing trust in recommendations, to improving learning, and all the way to diminishing sick time. While large language models may fail, I argue, paradoxically, that it is still worth trying to build these socio-pragmatic skills into conversational agents, and I will show some examples that attempt to do just that.

Professor and former Associate Dean, School of Computer Science, Carnegie Mellon University (2010-). Chaire Blaise Pascale and Chaire Sorbonne (2017-2018). On leave from CMU, at Inria since fall 2019. ACM Fellow (2017), Fellow Royal Academy of Scotland (2016), AAAS Fellow (2012), Anita Borg Women of Vision Award (2009). AAMAS test-of-time award (2017). Chair, World Economic Forum Global Agenda Council on Robotics & Smart Devices (2011-2014). Since January 2021 a member of CNNUM (Conseil National du Numérique) – French National Digital Council.

Can AI help developmental science and vice versa?

AI models based on deep learning have improved their performance to the point that they can be good candidate first order models of how human perceive objects and process language. Can they also be good candidate first order models of how humans learn such cognitive abilities? Here we examine the case of language acquisition in infants and review current results suggesting a tentative yes, and outline the remaining challenges and roadblocks.

Emmanuel Dupoux is full professor at the Ecole des Hautes Etudes en Sciences Sociales (EHESS), directs the Cognitive Machine Learning team at the Ecole Normale Supérieure (ENS) in Paris and INRIA (www.syntheticlearner.com) and is currently a part time scientist at Facebook AI Research. His education includes a PhD in Cognitive Science (EHESS), a MA in Computer Science (Orsay University) and a BA in Applied Mathematics (Pierre & Marie Curie University, ENS). He is the recipient of an Advanced ERC grant, the organizer of the Zero Resource Speech Challenge (2015, 2017, 2019) and the Intuitive Physics Benchmark (2019).

Turing Tests: Writing With and Against AI

What does it take to script a chatbot?
There are identifiable potentialities for literary form in the composition of these corporate assistants unusual speakers, composite and open to error as well as non-corporeal.
Can they ever pass, as Alan Turing envisioned, for human? At what cost to society, to language will they convince us? Decisions to personify technology and play along have forced other choices, and the representation of AI systems as, for example, accommodating women is not neutral, something that can be appreciated from the perspective of a worker performing feminized labor within, and to power, the machine. I will offer, putting it to the test, an account of my experience working as «AI UX Designer» at a New York and San Francisco-based firm.

Jacqueline Feldman, a writer and journalist, worked as a conversation designer for multiple US firms, scripting chatbot dialogue. This work and in particular Feldman's design choices around assigning gender to AI «personalities» has been featured in Engadget, Refinery29, and other outlets internationally as well as cited in the 2019 UNESCO report «I'd blush if I could»; she has written on the subject for The New Yorker, among others, and most recently at StatORec («A Human Wrote This,» July 2021). A graduate of Yale and the École des Hautes Études en Sciences Sociales, she is an MFA candidate and Teaching Associate at the University of Massachusetts Amherst.

Zombie Creativity: the death and resurrection of the author in the age of AI

Training OpenAI's GPT-3 (Beta) on my published and unpublished writings (including diaries) I am working to generate an AI version of myself as a writer.
This is not only a neat joke on autofiction's 'confessional' mode, the mode of several of my books, but allowed me to consider some of the political and economic questions surrounding contemporary writing practice as 'work'. A "decommodified» artwork (as defined by Leigh Claire la Barge in Wages Against Artwork), my project resembles 'work' as process, and produces 'a work', but both process and product float free of conventional notions of value and remuneration, simultaneously expanding and threatening conventional notions of human creativity, not to mention the ability of contemporary writers to sustain creative careers, and the place of the reader in the act of the production of art.
Working from Maria Vischmidt's (Goldsmiths UOL) proposal that 'anything that is not work can be art', working via an AI, a new kind of creative practice is produced that slyly questions the validity of works assumed to be produced by humanist subjectivities. A modest proposal: AIs producing artwork generated from the work of women and non-binary practitioners as well as practitioners (of colour) could quickly reverse the continuing imbalances in many art collections.

Joanna Walsh is a multidisciplinary writer for print, digital, public art and performance. She is the author of 11 books of fiction, essay and creative nonfiction, published by/forthcoming from Semiotext(e), Bloomsbury, Verso and others. Her digital textual projects include seed-story.com; Markievicz Mark II (working title: forthcoming for the 2020 Markievicz Award in the Republic of Ireland) and the Hull Story Map (http://humbermouth.com/the-hull-story-map/). She is currently working on a project for the 2021 Inside the Castle/Castle Freak remote residency for Generative Digital Composition (http://www.insidethecastle.org/castle-freak/). She is also a UK Arts Foundation Fellow, a university teacher, editor, and arts activist.

The linguistic competence of large language models

Neural language models based on the Transformer architecture, like GPT-3, achieve state-of-the-art performance at a variety of natural language processing tasks, including text generation. They also rival human performance on benchmarks designed to assess natural language understanding. Yet some have vividly criticized these models, describing them as mere «stochastic parrots» or «parlor tricks», and casting doubt on their ability to understand language. In this presentation, I will ask what kind of linguistic competence we can really attribute to these models. Against critics, I will argue not only that their syntactic competence is not far off from human-level performance, but also that they possess a non-trivial degree of semantic competence. I will also emphasize similarities between representations of words meanings in humans and in language models. I will conclude by reflecting upon the limits of current architectures, and how future research might further bridge the gab between artificial and biological language users.

Raphaël Millière is the Robert A. Burt Presidential Scholar in Society in Neuroscience at Columbia University in New York. His work pertains mainly to the philosophy of cognitive science and artificial intelligence. He currently works on two research projects. The first focuses on the relationship between visual perception and spatial self-location; it includes an experimental component, using virtual reality to test philosophical hypotheses. The second focuses on deep learning algorithms, and specifically whether natural language processing algorithms, like GPT-3, can be said to possess some form of semantic competence.

Chatbots and humans, from the book of Genesis to the opinion of the French national digital ethics committee

Abstract: Conversational agents are digital systems that interact with users in natural language. They can be found in numerous objects of everyday life: chatbots provide medical advice, facilitate hiring procedures, help to manage call centers, remotely educate the young, help doctors or lawyers, etc. Their use is rapidly growing across all industrial sectors. Their performance is also growing thanks to the «transformers»: gigantic neural networks that in the past 3 years have revolutionized natural language processing, including the design of conversational agents. New types of chatbots are potentially capable of having a far-reaching impact on the human condition: our norms and values will evolve under the influence of virtual friends, guardian angels or deadbots (chatbots trained on conversational data of a deceased person). Certain mythological narratives present Adam as co-creator of Nature via his action of naming all living beings, or Prometheus as creator of language. Interpretations of these narratives draw ethical and anthropological lessons pertaining to non-human speech. In November 2021, the French national digital ethics committee will join this reflective lineage as it prepares to publish an opinion on the ethics of conversational agents.

Alexei Grinbaum, Ph.D., HDR, is a physicist and philosopher at LARSIM, the Philosophy of Science Group at CEA-Saclay near Paris. His main interest is in the foundations of quantum theory. He also writes on the ethical and social aspects of emerging technologies, including nanotechnology, synthetic biology, robotics and artificial intelligence. Grinbaum is a member of the French national ethics committee for digital technologies (CNPEN) as well as of the French ethics commission for research in information technology (Cerna). He contributed to observatoryNano and RRI-Practice European projects and is currently leading research on ethical questions of high-impact emerging technologies in TechEthos project. His books include «Mécanique des étreintes» (2014) and «Les robots et le mal» (2019).

TESaCo

Le projet « Technologies émergentes et sagesse collective » (TESaCo) s'inscrit dans le cadre des travaux de l'Académie des sciences morales et politiques avec le soutien de la Fondation Simone et Cino Del Duca. Il apporte la contribution de l'Académie à l'une des problématiques majeures de l'époque : mesurer l'impact des nouvelles technologies, apprécier leurs potentialités à court et moyen terme, et préparer la société et ses membres à leur donner la place et l'orientation qu'ils jugent les meilleures. TESaCo réfléchit aux moyens pour nos sociétés d'acquérir une sagesse collective et de maîtriser les évolutions en cours.

The project «Emerging Technologies and Collective Wisdom» (TESaCo) is an investigation of the Académie des sciences morales et politiques with the support of the Simone and Cino Del Duca Foundation. It brings the contribution of the Academy to one of the major issues of our time: to measure the impact of new technologies, to appreciate their short and medium term potential, and to prepare society and its members to give them the place and the orientation that they judge best. TESaCo reflects on the means for our societies to acquire collective wisdom and to handle the evolutions in progress.

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