InterPARES Trust AI: Webinar 2
Project organization. New partners

Co-Directors: Luciana Duranti & Muhammad Abdul-Mageed
Project Coordinator: Corinne Rogers
Introduction to ITrustAI
July 14, 2021, 10:00 AM PDT
Agenda

● Welcome and details for today
● Focus on AI - Muhammad Abdul-Mageed
● Overview of new partners
● Hearing from new partners and researchers
  – Lyle Ungar, Isto Huvila, Emilio Suarez Gonzalez, Tania Cenquitelli
● Organizational structure
● Working Groups - descriptions and examples
● Wrap-up and outline of Webinar 3
InterPARES Trust AI: Webinar 2

Muhammad Abdul-Mageed
Deep Learning & NLP Lab
The University of British Columbia

ITrsutAI

July 14, 2021
Artificial Intelligence

Deep learning

Machine learning

AI

Webinar 2: Artificial Intelligence - July 14, 2021
Supervision

- Supervised

- Unsupervised

- Semi-supervised
Deep Learning

The Universe of Club (ITrust AI)

InterPARES Trust AI: Webinar 2

July 14, 2021
Attention Is All You Need

\[
\text{MultiHead}(Q, K, V) = \text{Concat}(\text{head}_1, \ldots, \text{head}_h)W^O
\]
where \(\text{head}_i = \text{Attention}(QW_i^Q, KW_i^K, VW_i^V)\)
Exploring the Limits of Transfer Learning with a Unified Text-to-Text Transformer

Colin Raffel
Noam Shazeer
Adam Roberts
Katherine Lee
Sharan Narang
Michael Matena
Yangli Zhou
Wei Li
Peter J. Liu
Google, Mountain View, CA 94043, USA

"translate English to German: That is good."
" cola sentence: The course is jumping well."
" stab sentence: The rhino grazed on the grass. sentence2: A rhino is grazing in a field."
" summarize: state authorities dispatched emergency crews tuesday to survey the damage after an onslaught of severe weather in mississippi."
"six people hospitalized after a storm in attala county."

Figure 1: A diagram of our text-to-text framework. Every task we consider—including translation, question answering, and classification—is cast as feeding our model text as input and training it to generate some target text. This allows us to use the same model, loss function, hyperparameters, etc. across our diverse set of tasks. It also provides a standard testbed for the methods included in our empirical survey. "T5" refers to our model, which we dub the "Text-to-Text Transfer Transformer".
Self-Supervision

High-performance speech recognition with no supervision at all

Pre-training
Fine-Tuning
Impact

Machine Translation

Speech

Image Captioning

https://research.googleblog.com/

https://research.googleblog.com/

https://research.googleblog.com/

https://translator.microsoft.com/help/articles/neural/

https://research.googleblog.com/

[Microsoft Research: He et al., 2015]
Better Language Models and Their Implications

We've trained a large-scale unsupervised language model which generates coherent paragraphs of text, achieves state-of-the-art performance on many language modeling benchmarks, and performs rudimentary modeling comprehension, machine translation, question answering, and summarization—all without task-specific training.

Image GPT

We find that, just as a large transformer model trained on language can generate coherent text, the same exact model trained on pixel sequences can generate coherent image completions and samples. By establishing a correlation between sample quality and image classification accuracy, we show that our best generative model also contains features competitive with top convolutional nets in the unsupervised setting.
Generative Models (II)

DALL·E: Creating Images from Text

We’ve trained a neural network called DALL·E that creates images from text captions for a wide range of concepts expressible in natural language.

- Text Prompt: an illustration of a baby daikon radish in a tutu walking a dog
- AI-Generated Images: [Images]

- Text Prompt: an armchair in the shape of an avocado . . .
- AI-Generated Images: [Images]
Can we develop AI systems for carrying out records and archives functions competently and efficiently while maintaining the nature and trustworthiness of the records?
AI Decisions: Challenges (I)

- **Authenticity** (of transformed content)
- **Bias** (reflects or amplifies bias in training data)
- **Fairness** (disproportionate impact on some groups)
- **Inconclusivity** (of outcomes, evidence, etc.)
AI Decisions: Challenges (II)

- Interpretability
- Privacy
- Traceability & Accountability (could be hard to assign responsibility)
- Transparency
Examples of Past Work

- **Recommendation systems** that connect relevant images to digitized text, by using handwritten text recognition (to make old documents searchable)

- **Visualization of the types of data stored on disk images** (using a combination of Named Entity Recognition, entity relations tools, and topic modeling)

- **Chatbots** that emulate human conversation through voice commands or text chats or both (to help knowledge seekers find connected information)

...
Relying on existing tools is limiting

Off-the-shelf tools may be problematic

What archives could look like with wider application of AI?

How can archival theory inform creation of AI tools?
Acknowledgement (+SSHRC PG)
New partners

- Univ. Politecnica delle Marche
- University of Bologna
- Politecnico di Torino
- State Archives of Venice
- Collabware
- State Archives of Milan
- Ingenium Canada
- State Archives of Turin
- MONOVA
- Central State Archive, Italy
- UBC Okanagan
- European Free Trade Association
- Univ. of Pennsylvania
- Historical Archives of the EU
- City University of New York
- SONY Computer Science Laboratories
- Big Data for Smart Society (GATE)
- Beijing Union University
- El Colegio de Mexico
- Tianjin University
- Unv. Autonoma de Barcelona
- Sorbonne - Abu Dhabi
- Univ. Federal do Rio Grande do Sul
- Anatolia Agency
- State Archives of Milan
- Int. Federation of Red Cross Archives
- State Archives of Turin
- Turkish Red Crescent Society
- State Archives of Venice
- National Archives of Slovenia
- State Archives of Milan
- National Library and Archives of Iran
- State Archives of Venice
- Central State Archive, Italy
- Historical Archives of the EU
- University of Havana
- SONY Computer Science Laboratories
- National Archives of Chile
- Ghana Institute of Management and Administration
- Unv. Federal do Rio Grande do Sul
- Sorbonne - Abu Dhabi
- University of Havana
New partners, new voices

Lyle Ungar - University of Pennsylvania
Isto Huvila - Uppsala University
Emilio Suarez Gonzalez - University of Havana
Tania Cerquitelli - Polytechnic of Turin
Organizational structure

[Diagram showing an organizational structure with positions like Co-Director, Executive Committee, Research Committee, Training Committee, Knowledge Mobilization Committee, Project Coordinator, IT Coordinator, and working groups such as Creation & Use Working Group, Appraisal & Acquisition Working Group, Arrangement & Description Working Group, Retention & Preservation Working Group, Management & Administration Working Group, and Reference & Access Working Group.]

https:// interparetrustai.org/assets/public/20210608-IPTAI-OrganizationalPolicy.pdf
Committee structure in practice

Steering committees:

- Research
- Training
- Knowledge Mobilization
- Executive

Each Working Group and Steering Committee Chair is a member of the Executive Committee.

Each WG chooses 1 representative for each Steering Committee (arrows shown for one WG only for simplicity).

Co-Directors
Project Coordinator

https://interparestrustai.org/assets/public/20210608-IPTAI-OrganizationalPolicy.pdf
Working groups

WG1: Creation & Use (CU)
WG2: Appraisal & Acquisition (AA)
WG3: Arrangement & Description (AD)
WG4: Retention & Preservation (RP)
WG5: Management & Administration (MA)
WG6: Reference & Access (RA)

Keywords for all WGs: Ethics, Transparency, Sustainability, Solidarity, Diversity, Inclusiveness, Equity, Responsibility, Caution, Privacy, Autonomy
Working groups

Creation and Use: Keywords
Making Records, Receiving Records, Form, Format, Function, Record Identity, Record Accuracy, Record Reliability, IP1 Benchmark Metadata for Authenticity, Records Classification, Access Privileges, FOIA, Privacy.

Appraisal and Acquisition: Keywords
Records Analysis, Holdings Analysis, Retention and Disposition Scheduling, Selection, Disposal, Transfer, Authentication, Accessioning, Accession Register, Accession Metadata.
Working groups

Arrangement and Description: Keywords
Archival Units, Documentary Relationships, Descriptive Standards, Language Analysis, Descriptive Instruments, Metadata.

Retention and Preservation: Keywords
In-house Repositories, Cloud Storage, Migration, Conversion, Records Identity and Integrity, IP1 Baseline Metadata, Authentication, Digitization, Digitized Records Metadata, Forensics of Preserved Material.
Working groups

Management and Administration: Keywords

Reference and Access: Keywords
Discoverability, Accessibility, Users, Uses, Online Services, Offline Access Services, Legal Issues, Security Issues, Privacy, Openness, Dissemination, Crowdsourcing.
## Working groups

<table>
<thead>
<tr>
<th>Creation &amp; Use</th>
<th>Appraisal &amp; Acquisition</th>
<th>Arrangement &amp; Description</th>
<th>Retention &amp; Preservation</th>
<th>Management &amp; Administration</th>
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<td>Erik Borglund</td>
<td>Jenny Bunn</td>
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<td>Jim Suderman</td>
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- Jessica Bushey
Working groups resources

On the website, in the restricted area:

• grant application documents
• templates for study proposals, reports, etc.
• information about meetings
• emails for all researchers

Questions?
Webinar 3

- July 16 @ 10AM PDT
- Research question, goals, methodologies
- Working groups break-out discussions
- Next steps, responsibilities, first in-person meeting, Milestones Report, financial reporting

Thank you!