Research Paper Discovery **Reimagined**

Design Sprint

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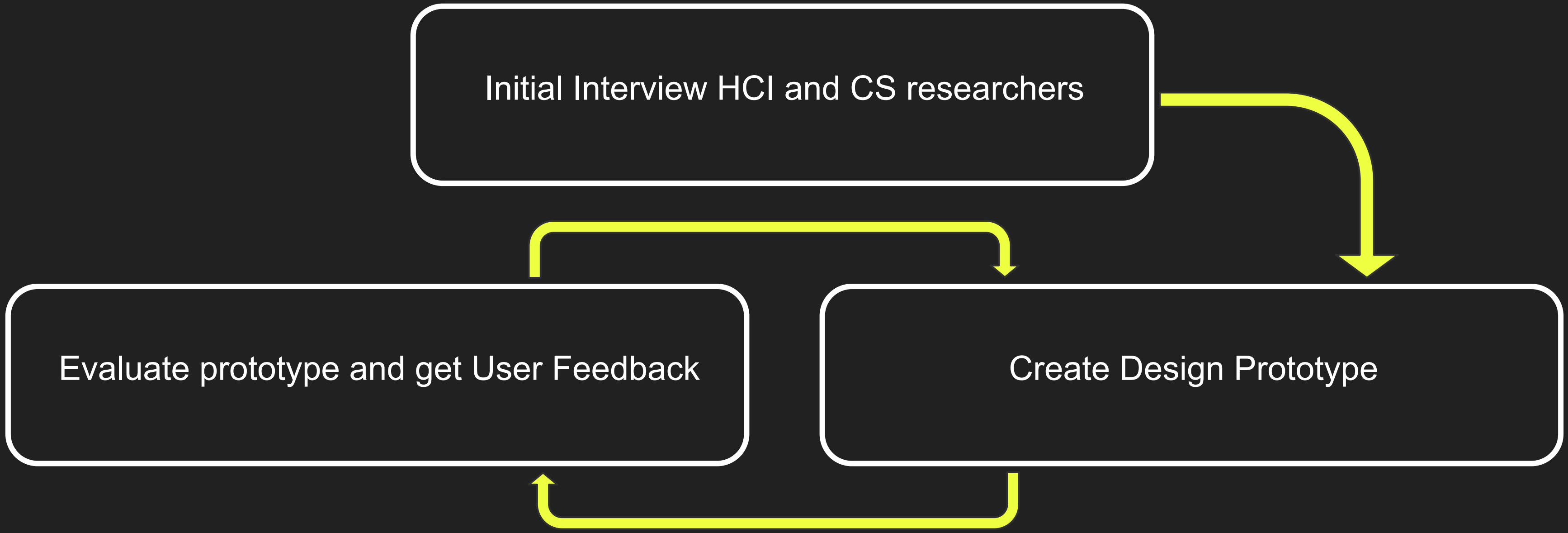
The Problem

- Finding new papers requires knowing the keywords

- For a keyword search, too many irrelevant papers are returned
  - Need better way of organizing relevant papers
  - Need ways to let users easily identify which paper is relevant

Design Process



Initial Interview Goals

1. What are the methods that they currently use?
2. How well are they working?
3. What are the important qualities in a paper?
4. How important is “recency” of a paper?
5. What is the most challenging part in paper discovery?

Initial Interview Results

1. Google Scholar is the most used tool
2. Other tools exist but aren’t much better than Google Scholar
3. Often, conferences are a good starting point
4. Coming up with the right keywords is challenging
5. Relevance is more important than Recency
6. Knowing what colleagues are working on
7. Most time-consuming part is choosing which paper to invest more time to read
8. Simple UI is a must

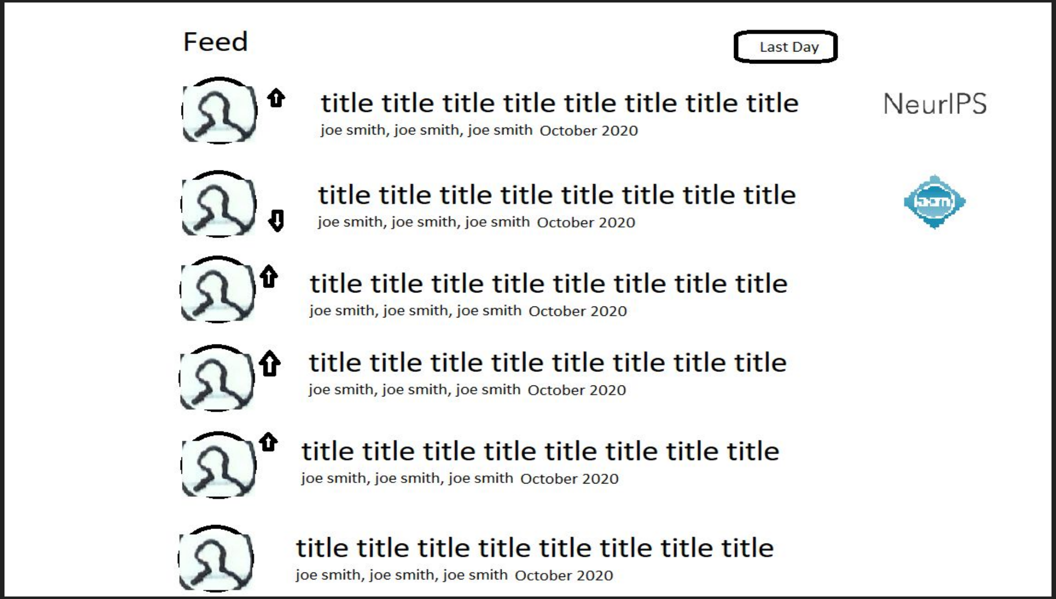
First Iteration Design Goals

- Designed as a Chrome Extension to Google Scholar

Components:

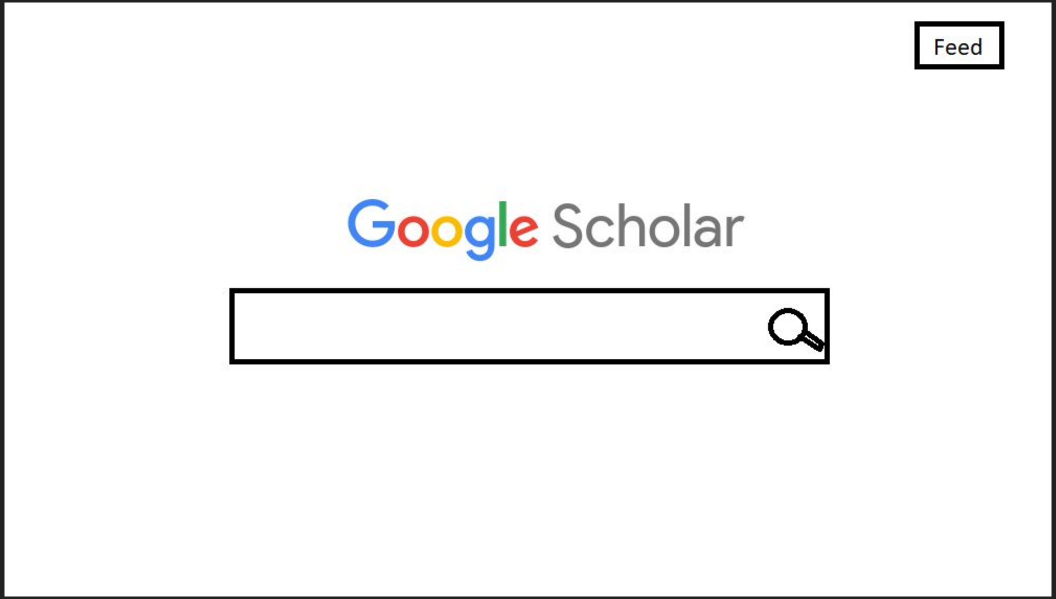
- Feed
- Paper Details
    - Key points
    - Related conferences
    - Citation tree

Low Fidelity Prototype



Paper rankings component on the Feed Page

Low Fidelity Prototype



Gateway button for feed feature on main Google Scholars Page.

(Intended as a Chrome Extension to Google Scholars)

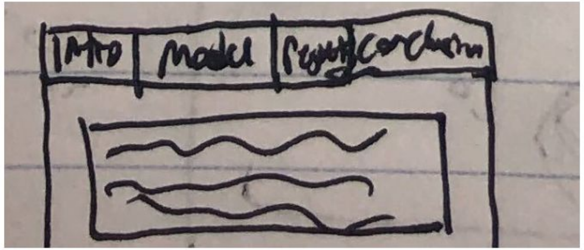
Low Fidelity Prototype

Paper Title: Paper title paper title

Ian Tenney, Dipanjan Das, Ellie Pavlick

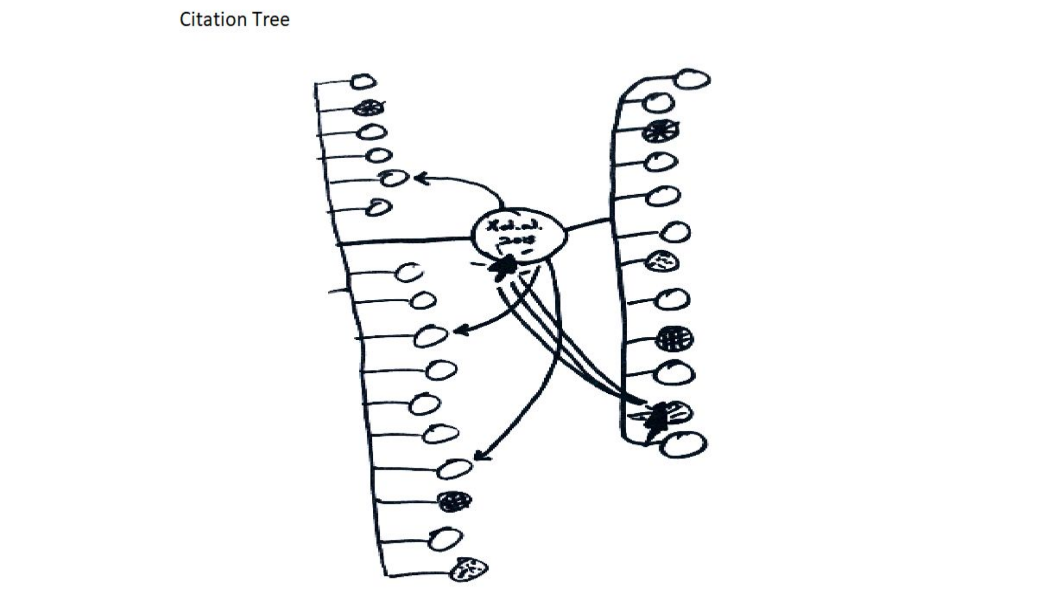
Pre-trained text encoders have rapidly advanced the state of the art on many NLP tasks. We focus on one such model, BERT, and aim to quantify where linguistic information is captured within the network. We find that the model represents the steps of the traditional NLP pipeline in an interpretable and localizable way, and that the regions responsible for each step appear in the expected sequence: POS tagging, parsing, NER, semantic roles, then coreference. Qualitative analysis reveals that the model can and often does adjust this pipeline dynamically, revising lower-level decisions on the basis of disambiguating information from higher-level representations.

Key Points



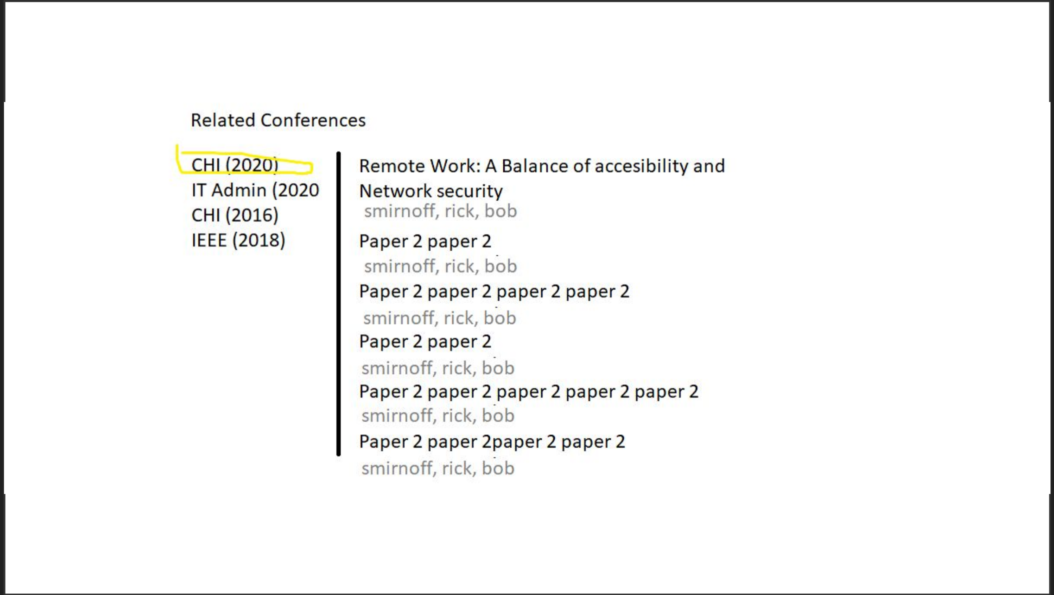
Key Points components on the Paper Details Page

Low Fidelity Prototype



Citation tree component on the Paper Details Page

Low Fidelity Prototype

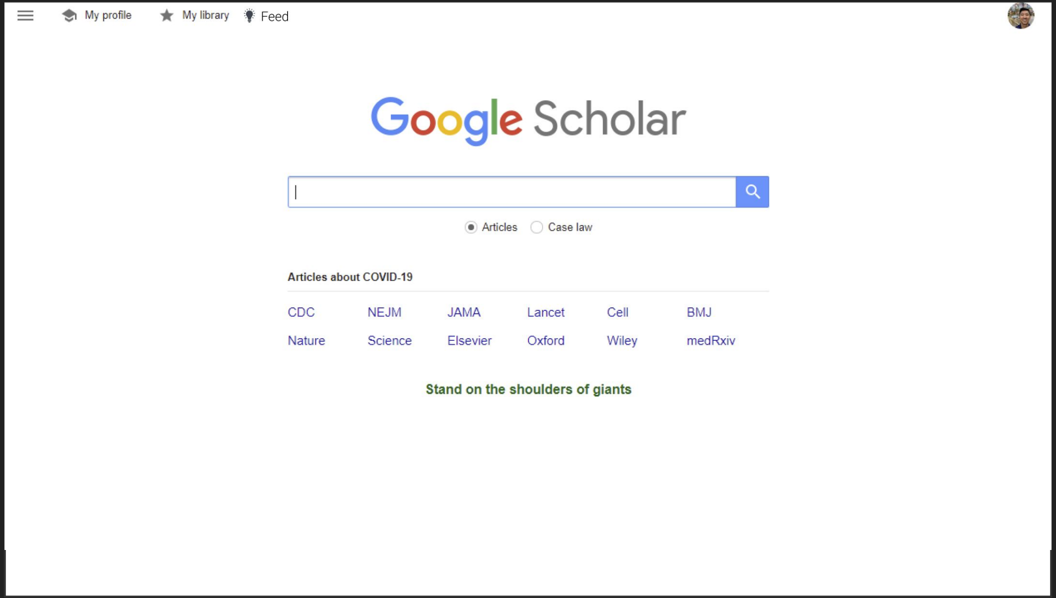


Related Conferences Component on Paper Details Page

First Iteration Evaluation

- Presentation of our design using the low fidelity prototype
- Feedback gathered immediately after the presentation
- Feedback points:
  - Specifics of the contents on the Paper Details page would be helpful to evaluate better
  - How do you switch between different fields of studies on Feeds Page?
  - Is there a way to have more details on the authors?

High Fidelity Prototype



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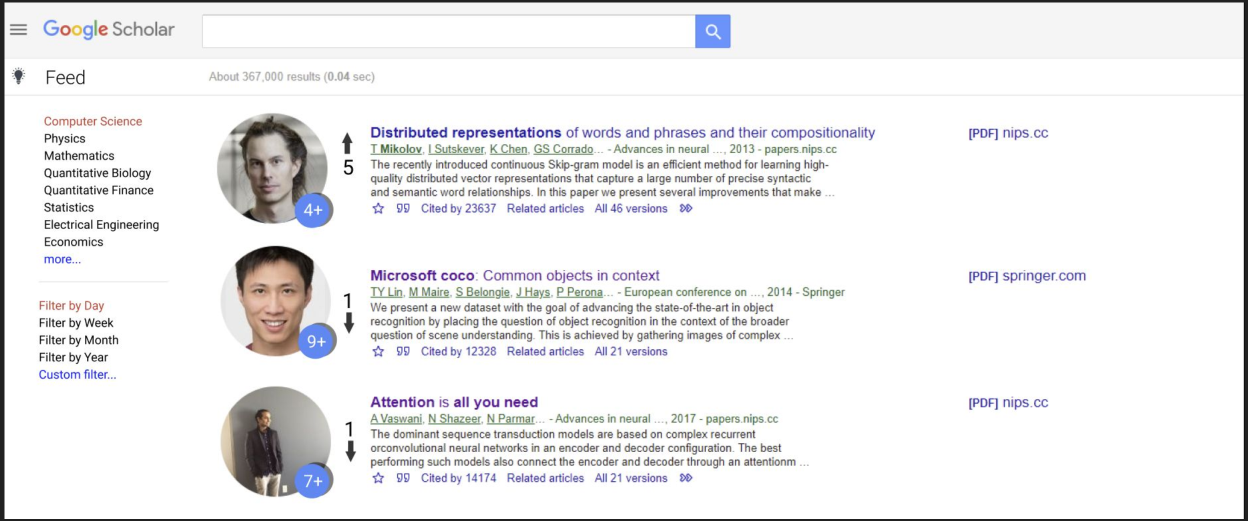
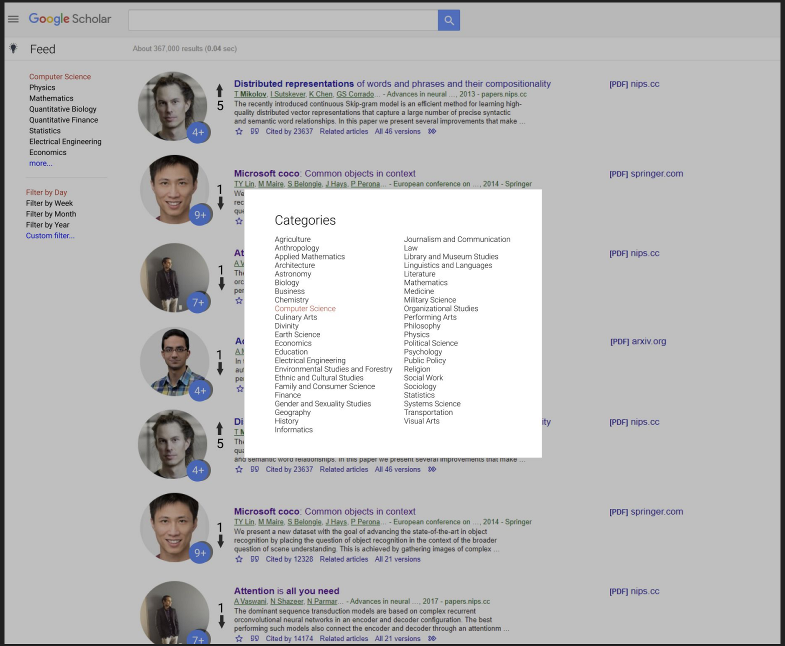


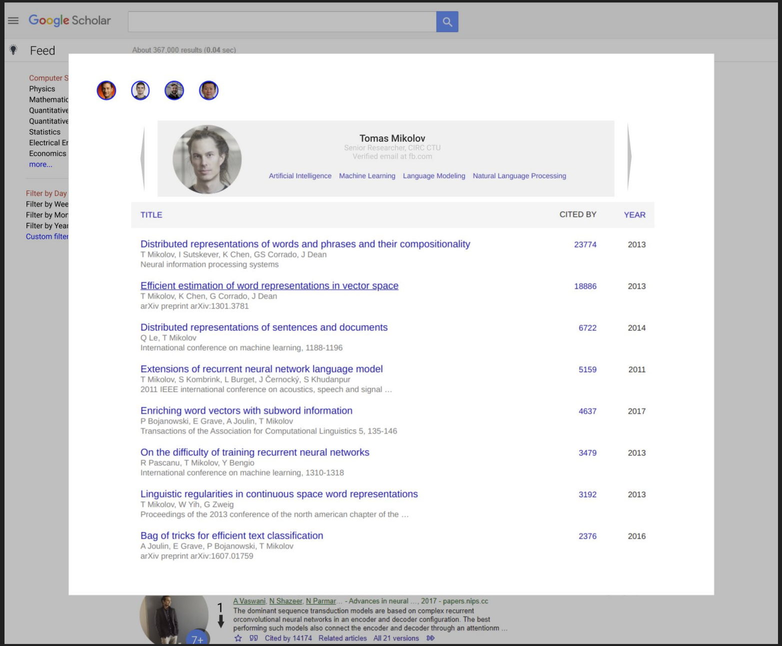
Paper rankings component on the Feed Page

High Fidelity Prototype



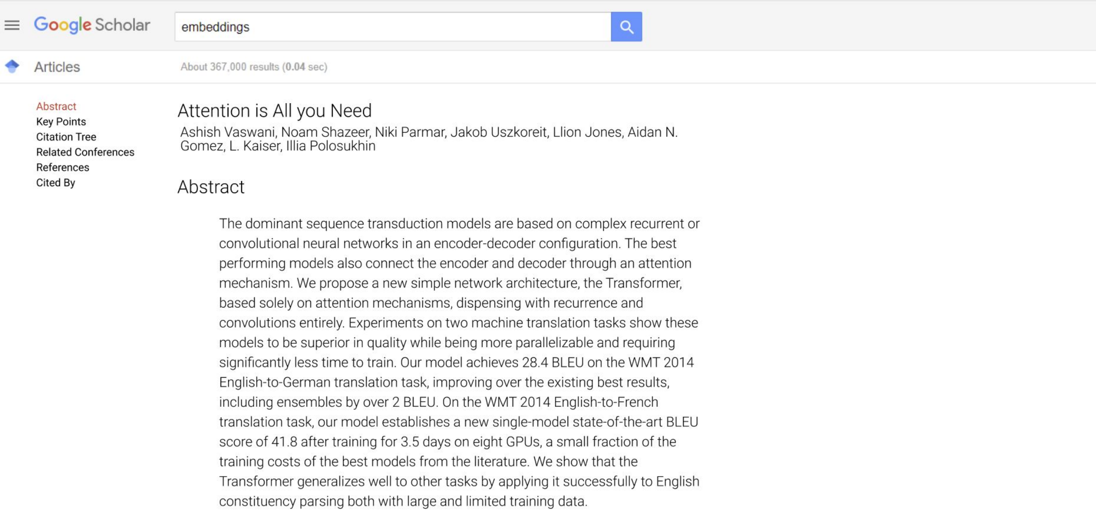
Options to choose different Fields of Study

High Fidelity Prototype



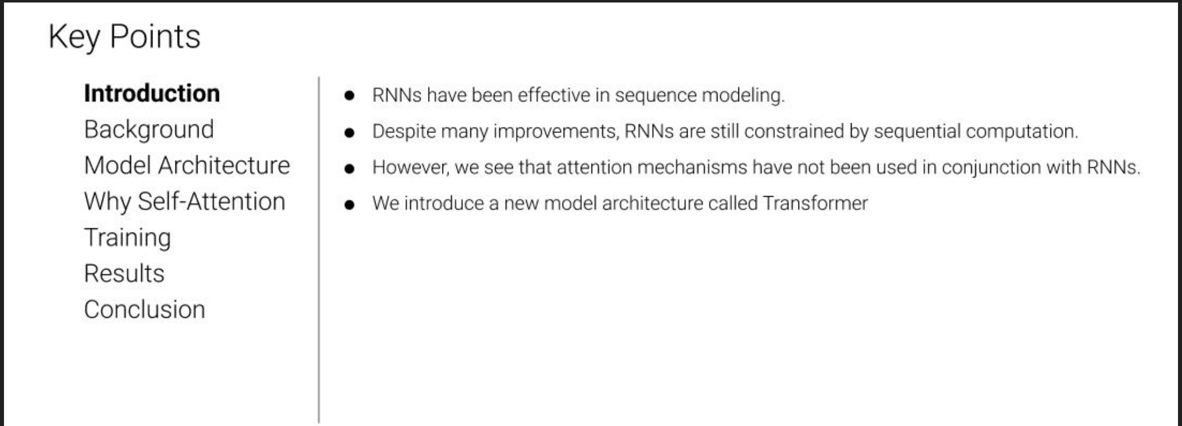
Author Details Pop Up

High Fidelity Prototype



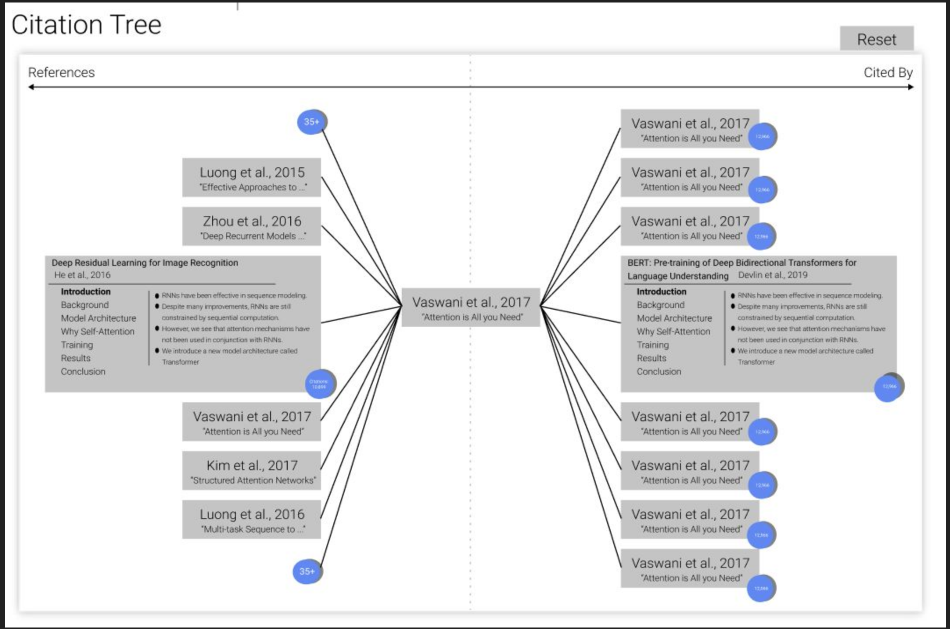
Paper Title, Authors, and Abstract components on Paper Details Page

High Fidelity Prototype



Key Points component on the Paper Details Page

High Fidelity Prototype



Citation Tree on the Paper Details Page

High Fidelity Prototype

References

Sequence to Sequence Learning with Neural Networks
Ilya Sutskever, Oriol Vinyals, Quoc V. Le 2014

Effective Approaches to Attention-based Neural Mahicne Translation
Thang Luong, Hiue Pham, Christopher D. Manning 2015

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A Deep Reinforced Model for Abstractive Summarization
Romain Paulus, Caiming Xiong, R. Socher 2018

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1 2 3 4 5 6 7 8 9 10 **Next**

References Component on the Paper Details Page

Second Iteration Evaluation

- Cognitive walkthrough and post-exercise questions via Virtual Interview
- Tasks that Participants attempted:
  1. Find the list of Computer Science papers that are trending on feed
  2. Find the list of Informatics papers that are trending on feed
  3. Find the key points from “Attention is all you need” paper from Feeds list
  4. Find a paper that is cited by “Attention is all you need” paper

Second Iteration Evaluation

- Cognitive walkthrough and post-exercise questions via Virtual Interview
- Post-Exercies Questions:
  1. What is your overall impression?
  2. How many of the 4 tasks above could you complete?
  3. Were there any aspects of the prototype that made it difficult to complete the tasks?
  4. If this prototype were to be implemented as a Chrome Extension, would you download and use it?
  5. Would you find an application like this helpful?
  6. Would you use it on a regular basis?

Second Iteration Evaluation

- Cognitive walkthrough and post-exercise questions via Virtual Interview
- Main Feedback Points:
  1. All 4 tasks were easily completed by all interviewees
  2. Google Extension idea is well received
  3. Features overlap with other websites, but having them on Google Scholar’s page is an advantage
  4. Difficult to gauge the usefulness of Key Points, because it will depend on the content
  5. Overall, participants are very impressed, and willing to try it out once developed

Link to our Figma Prototype

https://www.figma.com/proto/lqUszliOzubDax5me1SP79/INF231-Prototype?node-id=39%3A56&scaling=scale-down

Thank You