

6a.057.UVA - Learning Knowledge Search Techniques in the Law and Other Domains

Year 6 - Deep Dive Video

[6a.057.UVA_Deep Dive Video \(19:02 minutes\)](#)

Project Description

This research project uses reinforcement learning approach, network theory and NLP methodologies to develop a solution for a comprehensive, accurate and efficient knowledge acquisition process over the huge sets of data, especially textual documents. We mathematically modeled (legal) knowledge acquisition process and in its core, the information gathering procedure as a behavioral and cognitive process. Also, we developed an NLP methodology for the challenging task of representing a huge corpus of documents in a low dimensional mathematical structure, which preserves the most essential structures of the knowledge contained in the corpus. The developed NLP methodology was used to build a model of US Supreme Court legal corpus, U.S. Code, Code of Federal Regulations and Circuit Court Opinions. Then, consistent with the behavioral model of knowledge acquisition, three algorithms (Proximity method, Covering method & Adaptive method) were developed to replicate information gathering behavior of US (Supreme) Court judges from 1946-2005. The results generated by all three algorithms were compared to searches performed by a team of student research assistants at the University of Virginia School of Law. The design of the Adaptive Method, and in particular the procedure used for its reinforcement learning training, also allowed us to compare our results against second empirical source: observed citations of the US Supreme Court judges for out of training sample documents. For both data sources, we introduced model performance measures and additionally for the student-generated data, we compared the three models against each other.

Project Team

Team Member	Role	Email	Phone Number	Academic Sites/Industry Members
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Sumit Shah	IAB Project Mentor	Sumit Shah	Not Available	Funded by: CGI

Project Deliverables

	Deliverable
1.	Data driven mathematical models of search as behavioral and cognitive process and NLP modeling of (legal) documents
2.	And reinforcement learning prototypical system as an adaptive learning method for a search prediction model in law
3.	Inverse reinforcement learning prototypical system to develop an adaptive individual level learning prediction model
4.	Project report using our current datasets

Project Documents

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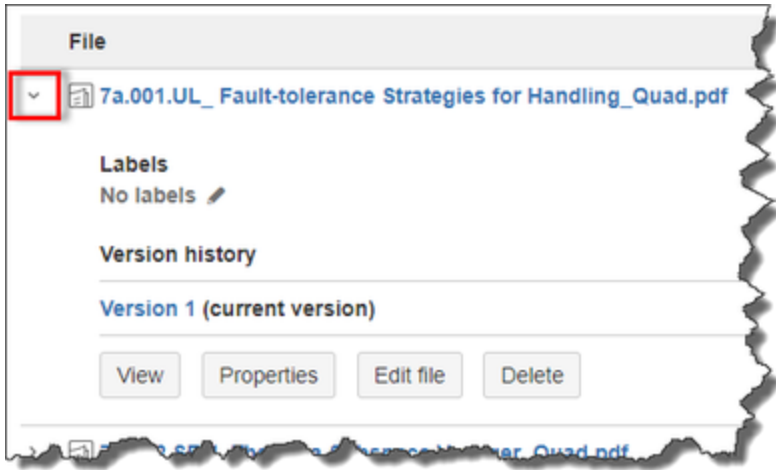
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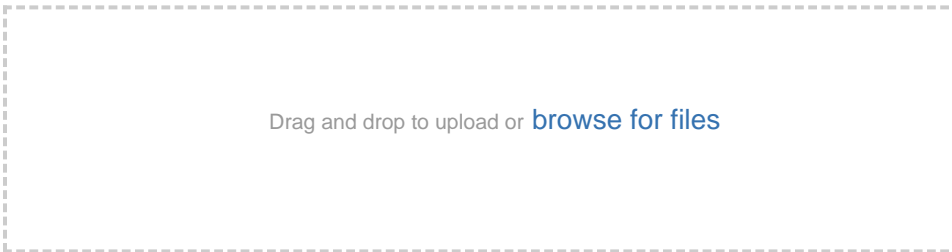
Spaces

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	CVDI 2017 IAB Fall Meeting				
	CVDI 2018 IAB Fall Meeting				
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	CVDI Calendar				
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File	Modified
> 6a.057.UVA_Posters_PPT.pptx	Oct 11, 2017 by Sally Johnson
> 6a.057.UVA_PPT Presentation.pptx	Oct 11, 2017 by Sally Johnson
> 6a.057.UVA_Quad Chart.pptx	Oct 11, 2017 by Sally Johnson
> 6a.057.UVA_Executive Summary_ORIGINAL.docx	Oct 11, 2017 by Sally Johnson
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> 11-10-2017 11-28-32 AM.png	Nov 10, 2017 by Sally Johnson
> 6a.057.UVA_Learning Knowledge Search Techniques_Poster_2017 Fall Meeting.pptx	Nov 13, 2017 by Sally Johnson
> 6a.057.UVA_CVDI Mid-Year Report.docx	Dec 28, 2017 by Sally Johnson
> Year 6_Final Project Report-faraz.pdf	Jul 28, 2018 by stephen adams



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Project Comments

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- CVDI SITE (Drexel University) +

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- CVDI SITE (University of North Carolina at Charlotte) +

- CVDI SITE (University of Virginia) +

- IAB - Industry Advisory Board +

- Year 6 - Funded Projects (7/1/17 - 6/30/18) +

- Year 7 - Funded Projects (7/1/18 - 6/30/19) +

- Year 8 - Proposed Projects +

