

Shruthi Chari

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105 8th St ◇ Troy, NY 12180

EDUCATION

Rensselaer Polytechnic Institute

Troy, NY

Doctor of Philosophy in Computer Science

June 2024 (Expected)

- Research Interests: Explainable AI, Ontologies & Healthcare NLP and Informatics
- Advisor: Prof. Deborah L. McGuinness and Prof. Oshani Seneviratne
- GPA: 3.78/4.00

Rensselaer Polytechnic Institute

Troy, NY

Master of Science in Computer Science

May 2019

- Research Interests: Scientific Representation, Ontologies & Healthcare Informatics
- Advisor: Prof. Deborah L. McGuinness
- GPA: 3.84/4.00

PES Institute of Technology

Bangalore, India

Bachelor of Engineering in Computer Science

May 2015

- GPA: 9.18/10.00

EXPERIENCE

Rensselaer Polytechnic Institute, Research Assistant

Troy, NY

Advised by Prof. Deborah L. McGuinness and Prof. Oshani Seneviratne

Aug. 2023 - Present

- As a part of the IARPA HIATUS project:
 - Investigating methods to represent text explanations in authorship attribution setting.

Rensselaer Polytechnic Institute, Research Assistant

Troy, NY

Advised by Prof. Deborah L. McGuinness and Prof. Oshani Seneviratne

Aug. 2019 - Present

- As a part of the IBM-RPI initiative Health Empowerment by Analytics, Learning and Semantics (HEALS) and my PhD thesis:
 - Designed an explanation ontology to structure and support the creation of different explanation types from the dependencies in the system, user, and interface spaces.
 - Designed an end-end approach to provide contextual explanations to help clinicians better interpret machine learning predictions in a comorbidity risk prediction setting.
 - Specifically, we developed a question-answering (QA) system that leverages large language models (LLMs) and knowledge augmentations from domain ontologies to these models, to generate answers which contain contexts from authoritative medical literature like guidelines.
 - Currently, investigating approaches to generate and combine user-centered explanations from model explanations coming from different AI methods and data modalities.

Center for Computational Health, IBM Research, Research Extern

Troy, NY

Hosted by Dr. Prithwish Chakraborty

May 2021 – September 2021

- As a part of a multi-thrust clinical explainability project:
 - Lead an effort (along with mentors) to improve question answering over medical guidelines, with a focus on type-2 diabetes guidelines.

- Worked with other student interns and mentors from IBM and RPI, to create a working demo of the different thrusts in the project including the knowledge-augmented question-answering (QA), risk prediction model and a user-facing dashboard prototype.
- Helped in conducting expert panels interviews using the dashboard as a means to collect clinician feedback on our contextual explanation approach.

IBM Research, Intern

Hosted by Dr. Ching-Hua Chen

Yorktown Heights, NY

May 2019 - Aug 2019

- Investigated and implemented semantic methods to align patient's temporal physical activity data to population descriptions in behavior change literature, with the goal of suggesting relevant studies.
- Built a HealthKit ontology to model physical activity data in a personal knowledge graph (KG) and reused the Study Cohort Ontology (SCO) to model population descriptions in a literature KG.
- Developed a prototype explainable natural language explanation for the match between patients and populations.

Rensselaer Polytechnic Institute, Research Assistant

Advised by Prof. Deborah L. McGuinness

Troy, NY

May 2018 - May 2019

- As a part of the IBM-RPI initiative Health Empowerment by Analytics, Learning and Semantics (HEALS) and my Masters thesis:
 - Designed an ontology-enabled prototype system (built the SCO ontology) to model descriptions of study populations found in research studies cited in the pharmaceutical and cardiovascular comorbidities chapters of the ADA Standards of Medical Care 2018 in RDF KGs.
 - Enabled study applicability analyses supported via SPARQL queries on the SCO KG to:
 - Implement cohort similarity visualizations, to determine similarity between patient and treatment arm at a glance.
 - Design queries on the SCO KG to determine study match and study quality, and to identify study limitations.

Rensselaer Polytechnic Institute, Research Assistant

Advised by Prof. Oshani Seneviratne and Prof. Deborah L. McGuinness

Troy, NY

Jan 2018 - May 2018

- As a part of the IBM-RPI initiative Health Empowerment by Analytics, Learning and Semantics (HEALS):
 - Designed an interactive web tool using the Whyis framework, to visualize impact on patient's stage change, treatments/tests between AJCC 7th and 8th edition of guidelines.
 - Collaborated on gathering data for the evaluation. Enhanced extracted SEER (Surveillance, Epidemiology, and End Results Program) patient data by automatically appending gender-specific patient names from a Natural Language Toolkit (NLTK) name corpus.

CloudInfra, Software Engineering Intern

Hosted by New Melchizedec Sundaraj

Bangalore, India

Dec 2016 – Jul 2017

- Reengineered the integration of search results(retrieved from the client) into the in-house developed Magento extension, Expertrec; to allow for the extension to co-exist with other plugins on a client's search results page.
- Built a rule engine in Python to parse NLP queries for search, mainly handled price intent queries.

Aryaka Networks India Private Limited, Software Engineer

NOS Engineering Team

Bangalore, India

Jul 2015 - Nov 2016

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Cisco Systems India Private Limited, Software Engineering Intern <i>Weber IT</i>	Bangalore, India <i>Jan 2015 - Jun 2015</i>
Aryaka Networks India Private Limited, Software Engineer Intern <i>NOS Engineering Team</i>	Bangalore, India <i>Jun 2014 - Aug 2014</i>
PES Institute of Technology, Masters Thesis <i>Advised by Prof. Ramamoorthy Srinath</i>	Bangalore, India <i>Jan 2015 - May 2015</i>
· Title: Machine Translation Using Deep Learning	
PES Institute of Technology, Research Assistant <i>Advised by Prof. Kavi Mahesh</i>	Bangalore, India <i>June 2012 - May 2014</i>
· Knowledge Analytics and Ontology Engineering (KAnOE) Lab	

SKILLS

Programming	(Proficient) Python, Java, OWL, RDF/XML, \LaTeX ; (Familiar) C, Shell, PHP, JQuery, Groovy, Javascript
Frameworks	BERT, Pytorch, Protégé, Git, SPARQL, Flask, Ubuntu, Docker,
Amazon EC2,	Google Colab, SQL, CUDA
Relevant courses	Natural Language Processing, Machine Learning (ML) from Data, Ontologies, Deep Learning, Design of Experiments, AI for Conservation

SELECTED PUBLICATIONS

1. **An Ontology-Enabled Approach For User-Centered and Knowledge-Enabled Explanations of AI Systems**
Shruthi Chari
In Doctoral Consortium@ ISWC 2023 (in press); 2023.
2. **Semantically enabling clinical decision support recommendations**
Oshani Seneviratne, Amar K. Das, Shruthi Chari, Nneka N. Agu, Sabbir M. Rashid, Jamie P. McCusker, Jade DS Franklin, Mia Qi, Kristin P. Bennett, Ching-Hua Chen, James A. Hendler, Deborah L. McGuinness
J. of Biomedical Semantics, In Press, 2023
3. **Explanation Ontology: A General-Purpose, Semantic Representation for Supporting User-Centered Explanations**
Shruthi Chari, Oshani Seneviratne, Mohamed Ghalwash, Sola Shirai, Daniel M. Gruen, Pablo Meyer, Prithwish Chakraborty, Deborah L. McGuinness
Semantic Web J., In Press, 2023
4. **Informing clinical assessment by contextualizing post-hoc explanations of risk prediction models in type-2 diabetes**
Shruthi Chari, Prasant Acharya, Daniel M. Gruen, Olivia Zhang, Elif K. Eyigoz, Mohamed Ghalwash, Oshani Seneviratne, Fernando S. Saiz, Pablo Meyer, Prithwish Chakraborty, Deborah L. McGuinness
Artificial Intell. Medicine J., 102498; 2023
5. **Leveraging Clinical Context for User-Centered Explainability: A Diabetes Use Case**
Shruthi Chari, Prithwish Chakraborty, Mohamed Ghalwash, Oshani Seneviratne, Elif K. Eyigoz, Daniel M. Gruen, Fernando S. Saiz, Ching-Hua Chen, Pablo Meyer, Deborah L. McGuinness
KDD Applied Data Science in Healthcare (DSHealth) Workshop; 2021 [Best Workshop Paper]

6. **Explanation Ontology: A Model for User-Centric Explainable AI**
Shruthi Chari, Oshani Seneviratne, Daniel M. Gruen, Morgan Foreman, Amar K Das, Deborah L. McGuinness
 In International Semantic Web Conference (pp. 228 - 243); 2020 [Best paper award]
7. **Foundations of Explainable Knowledge-Enabled Systems**
Shruthi Chari, Oshani Seneviratne, Daniel M. Gruen, Deborah .L McGuinness
 Knowledge Graphs for eXplainable AI – Foundations, Applications and Challenges. Studies on the Semantic Web, pp 23 - 48; 2020
8. **Directions for Explainable Knowledge-Enabled Systems**
Shruthi Chari, Oshani Seneviratne, Daniel M. Gruen, Deborah .L McGuinness
 Knowledge Graphs for eXplainable AI – Foundations, Applications and Challenges. Studies on the Semantic Web, pp 245 - 261; 2020
9. **Knowledge Extraction of Cohort Characteristics in Research Publications**
Jade DS Franklin, Shruthi Chari, Morgan Foreman, Oshani Seneviratne, Jamie P. McCusker, Amar K. Das, Deborah L. McGuinness
 In Proc. of 2020 AMIA Annual Symposium; 2020
10. **Identifying Ontology Concepts of Study Cohort Terms via NCBO Annotator**
Jade DS Franklin, Shruthi Chari, Morgan Foreman, Oshani Seneviratne, Jamie P. McCusker, Amar K. Das, Deborah L. McGuinness
 In Proc. of In SeWeBMeDa; 2020
11. **Enabling Trust in Clinical Decision Support Recommendations through Semantics**
Oshani Seneviratne , Amar K. Das, Shruthi Chari, Nneka N. Agu, Sabbir M. Rashid, Ching-Hua Chen, Jamie P. McCusker, James A. Hendler, Deborah L. McGuinness
 In SeWeBMeDa@ ISWC, pp. 55-67. 2019.
12. **G-PROV: Provenance Management for Clinical Practice Guidelines**
Nneka N. Agu, Neha Keshan, Shruthi Chari, Oshani Seneviratne, Sabbir M. Rashid, Jamie P. McCusker, Amar K. Das, Deborah L. McGuinness
 In SeWeBMeDa@ ISWC 2019, pp. 55-67. 2019
13. **Making Study Populations Visible through Knowledge Graphs**
Shruthi Chari, Mia Qi, Nneka N. Agu, Oshani Seneviratne, Jamie P McCusker, Kristin P. Bennett, Amar K. Das, Deborah L. McGuinness
 In International Semantic Web Conference (pp. 53-68). Auckland, New Zealand; 2019
14. **Semantically-targeted analytics for reproducible scientific discovery**
Alexander New, Shruthi Chari, Mia Qi, Sabbir M. Rashid, John S. Erickson, Deborah L. McGuinness, Kristin P. Bennett
 In Automatic Information and Data Reuse, pp 1 - 4. Pittsburgh, PA; 2019
15. **Knowledge Integration for Disease Characterization: A Breast Cancer Example**
Oshani Seneviratne, Sabbir Rashid, Shruthi Chari, Jamie P McCusker, Kristin P. Bennett, James A. Hendler, Deborah L. McGuinness.
 In International Semantic Web Conference (pp. 223-238). Monterrey, California; 2018

AWARDS AND HONORS

Fellowships and Scholarships

- Research grant to attend the International Semantic Web Conference (ISWC) – 2023, 2018
- Research grant to attend the International Semantic Web Summer School (ISWS) – 2018

Conferences

- Best Workshop Paper at KDD Applied Data Science in Healthcare (DSHealth) Workshop, 2021
- Best Resource Paper at International Semantic Web Conference (ISWC), 2020
- One of the Top 6 Best Posters at MIT-IBM AI Research Week, 2019
- Best Presentation and Best Research Report Award at Intl. Semantic Web Summer School (ISWS), 2018.

SERVICE & LEADERSHIP

Reviewer

- Artificial Intelligence in Medicine (AIM) Journal '23
- International Semantic Web Conference (ISWC) '21, '22, '23
- AMIA Annual Symposium '21, '22
- Semantic Web J. '22
- International Conference on AI in Medicine '22
- Semantic Web meets Health Data Management Workshop at ESWC '22
- Heterogeneous Graph and Deep Learning Workshop at KDD '21
- Knowledge Infused Learning Workshop at KGC '21
- Artificial Intelligence '21
- Journal of Web Semantics '21
- AI for Social Good Workshop at AAI '20

Organization Leadership

- Co-lead a team at the NLM Pubmed Hackathon, 2022.
- Social Media Chair, Comp. Science Graduate Council, RPI, Aug. 2021 - May 2023
- Member of the organizing committee for MIT Media Labs event (2012) and code Hackathon(2012-2014)

Teaching

- Teaching Assistant for Foundations of Comp. Science, RPI, Spring 2018
- Teaching Assistant for Computer Science 101: Python, RPI, Fall 2017