

## Kelsey Rook

### CONTACT

Email: rookk@rpi.edu

### EDUCATION

#### B.S. Computer Science

*Andrews University*

May 2020

*Berrien Springs, MI*

Mathematical Studies secondary major

Magna Cum Laude

J.N. Andrews Honors Scholar

Pi Mu Epsilon member

*Selected Coursework:*

Artificial Intelligence, Machine Learning, Mathematical Modeling in Biology

#### PhD Computer Science

*Rensselaer Polytechnic Institute*

Expected August 2026

*Troy, NY*

*Selected Coursework:*

Data Mining, Machine Learning from Data, Computer Vision, Frontiers of Network Science, X-informatics, Ontology Engineering

### PUBLICATIONS

Rook, K., Santos, H., McGuinness, D., Sprung, M., Pinheiro, P., and B. Chorpita. Supporting Psychometric Instrument Usage through the POEM Ontology. Submitted to: *Transactions on Graph Data and Knowledge*

Rook, K. Open Knowledge Extraction from Dialogue Using In-Context Learning. *Doctoral Consortium at The 24th International Semantic Web Conference, 2025*

Rashid, S. M., Erickson, J. S., McCusker, J. P., Santos, H., Pinheiro, P., Chari, S., ... & McGuinness, D. L. (2024). Supporting Next-Generation Science with a Semantic Ecosystem.

Chung, J., Jacoby-Cooper, G., Rook, K., Santos, H., Shelden, D., Kendall, E. F., and D. L. McGuinness. Towards an Indoor Environmental Quality Management Ontology. *First International Workshop on Semantic Web on Constrained Things@ ESWC-23 (SWoCoT-23)*, 2023.

Rook, K., Witt, B., Bailey, R., Geigel, J., Hu, P., and A. Kothari. A Study of User Intent in Immersive Smart Spaces. *2019 IEEE International Conference on Pervasive Computing and Communications Workshops, Pervasive Smart Living Spaces (PerLS) workshop*, pp. 227-232.

### CONFERENCES AND PRESENTATIONS

Rook, K., Santos, H., Sprung, M., McGuinness, D., and B. Chorpita. Semantic Modeling of Evidence for Psychometric Instrument Usage. *Mobilizing Computable Biomedical Knowledge (MCBK)*.

October 2024.

Rook, K., Santos, H., Chorpita, B. F., Sprung, M. S., Pinheiro, P., & McGuinness, D. L. Towards an Ontology of Psychometric Measures. *The Healthcare and Life Sciences Symposium (HCLS)*, co-located with *The 2024 Knowledge Graph Conference (KGC)*. May 2024.

Sprung, M. S., Santos, H., Rook, K., Pinheiro, P., McGuinness, D. L., & Chorpita, B. F. Psychometric Assessment Issues and Potential Opportunities. *The Healthcare and Life Sciences Symposium (HCLS)*, co-located with *The 2024 Knowledge Graph Conference (KGC)*. May 2024.

Santos, H., Rook, K., Pinheiro, P., Gruen, D. M., Chorpita, B. F., and D.L. McGuinness. Facilitating Reuse of Mental Health Questionnaires via Knowledge Graphs. *The Healthcare and Life Sciences Symposium (HCLS)*, co-located with *The 2024 Knowledge Graph Conference (KGC)*. May 2023.

Seventeenth IEEE International Conference on Pervasive Computing and Communications, Workshop Session on Pervasive Smart Living Spaces (PerLS): “A Study of User Intent in Immersive Smart Spaces”, March 11, 2019, jointly with Blair Witt.

## **POSTER PRESENTATION**

American Physical Society April Meeting: “Finding Optimal Input Parameters for BayesWave”, April 14, 2018.

## **RESEARCH FUNDING**

- Travel support from the NSF, Seventeenth IEEE International Conference on Pervasive Computing and Communications, Workshop Session on Pervasive Smart Living Spaces (PerLS), March 2019
- Travel support from the Council on Undergraduate Research, Physics and Astronomy Division (CURPA), American Physical Society April Meeting, 2018

## **RESEARCH TEAM:**

Andrews University Gravitational Wave Group: Principal Investigator Tiffany Summerscales, 2017-2020

Tetherless World Constellation: Principal Investigator Deborah L. McGuinness, Spring 2023-present

## **SCHOLARSHIPS AND AWARDS**

### **Andrews University**

Andrews Partnership Scholarship recipient (full tuition), 2016-2020

J. N. Andrews Honors Scholar, 2020

### **Rensselaer Polytechnic Institute**

Rensselaer Graduate Fellowship recipient, 2020-2021

## PROFESSIONAL SOCIETIES

Society of Women Engineers

- Vice President

American Physical Society

**December 2016 - December 2020**

**August 2018 - December 2020**

**January 2018 - January 2019**

## RESEARCH EXPERIENCE

**Rensselaer Polytechnic Institute (AFRL)**

**August 2023 - May 2025**

Generated a knowledge graph based on dialogue transcripts between expert intelligence analysts and a task-oriented dialogue system; created a system that uses an expert knowledge graph to generate next step suggestions and augment dialogue system responses to be more supportive to novice users

Applied prompt engineering techniques to improve question answering over hybrid textual and tabular financial documents, particularly questions with ambiguity

**Rensselaer Polytechnic Institute (NIMH)**

**January 2023 - August 2023**

Supported the creation of the Psychometric Ontology of Experiences and Measures (POEM), which supports the creation, use, and reuse of evaluation instruments in clinical and research settings. Expanded POEM to support the modeling of psychometric research evidence.

**Andrews University Department of Physics**

**September 2017 - August 2020**

Undergraduate Research Assistant: ran Bayesian algorithm to model and detect gravitational signals, glitches, and noise in LIGO detector data over several parameter combinations, and wrote scripts to organize and analyze data to determine which parameters allow for the most accurate classification of data. Used as J.N. Andrews Honors program senior thesis.

**Rochester Institute of Technology**

**Summer 2018**

Computational Sensing REU participant: created an immersive Augmented Reality (AR) smart home environment for the Microsoft HoloLens, conducted experiments with human subjects to test AR environment, and tested usability of collected data with activity recognition algorithms.

**Northrop Grumman— Mission Systems Sector**

**Summer 2019**

Human-Machine Teaming (HMT) Development Engineer: supported the HMT independent research and development (IRAD) team, which used mental workload levels inferred from various physiological data to create artificially intelligent agents which assist workers in states of mental overload or underload. Ported an existing signal processing pipeline from Python into C++ to boost performance, and tested the performance of a support vector machine (SVM) classifying processed mental workload data.

## **ADDITIONAL SKILLS**

OWL/RDF • SPARQL • Protégé • Python • Git • Linux • LaTeX • HTML/CSS • JavaScript

## **PROFESSIONAL EXPERIENCE**

### **Laurel Lake Summer Camp**

**Summer 2017**

Counselor and Archery Director: supervised a cabin of 7-15 children from ages 6-18 for four weeks, created a week-long curriculum to introduce kids of multiple age groups to archery, and formed relationships with campers while helping them build life skills

### **Andrews University Student Movement**

Student Writer, Arts & Entertainment

**September 2017 - May 2018**

Student Writer, Ideas

**January 2019 - May 2019**

### **Rensselaer Polytechnic Institute Department of Computer Science**

Teaching Assistant, Foundations of Computer Science

**Fall 2021, Spring 2022, Fall 2022**

Teaching Assistant, Computer Organization

**Summer 2022**

Teaching Assistant, Open Source Software

**Summer 2022**

Teaching Assistant, Bridge Scholars Program

**Summer 2022**

## **SERVICE PROJECTS**

### **HELP Project, Andrews University**

**January 2017 - May 2018**

Interacted with fourth-graders on a biweekly basis with a supplementary curriculum to encourage a passion for learning, and assisted teachers working in an under-funded school district

### **Andrews University Engineering and Computer Science Dept.**

**August 2017 - May 2018**

Student Coordinator: Planned social outings and extracurricular programming for academic department