



CONTACT  
INFORMATION

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EDUCATION

**University of Southern California;** Los Angeles, CA, USA

**Aug 2018 - Present**

PhD Candidate, Computer Science

Research Interests: Knowledge Graphs • Machine Learning • Geospatial Artificial Intelligence • Information Integration • Semantic Web • Data Science

Dissertation: “Automatic Semantic Spatio-Temporal Interpretation of Digitized Historical Maps” (Advisor: Prof. Craig A. Knoblock)

**Tel Aviv University;** Tel Aviv, Israel

**Feb 2011 - Jan 2015**

BSc, Electrical and Electronic Engineering, *magna cum laude* (Cumulative GPA: 93.33/100)

Major Coursework Areas: Computer-Science • Communications • Electronic Devices

Honor's Thesis: “IPoIB Router in the Switch-X Product Family: from Firmware Design to Implementation of the Verification Environment and the Debug Tools” (Supervisor: Mr. Ami Marelli)

EXPERIENCE

**Information Sciences Institute;** Marina del Rey, CA, USA

**Aug 2018 - Present**

**Research Assistant,** *Center on Knowledge Graphs*

- Working on knowledge graphs with an emphasis on automatic spatio-temporal & semantic interpretation of topographic map data as a means to solve complex information integration problems
- Investigating new methodologies to leverage machine & deep learning techniques to establish automatic data understanding & knowledge graph construction in different domains
- Partaking in several projects: MinMod (AI for mineral data), Linked Maps (constructing KGs for spatio-temporal data), MINT (data integration for scientific modeling) & Table Understanding (automated semantic interpretation of tables)
- Semi-finalist at the Amazon Alexa Prize Socialbot Grand Challenge 4 (knowledge integration)
- Supervised & mentored MS student-workers (MINT & Linked Maps projects)
- Supervised & mentored an intern student (IIT Delhi) in the Indo-U.S. Science & Technology Forum (IUSSTF) at USC-ISI working on geospatial semantics

**IBM Research;** Almaden, San Jose, California, United States

**May - Aug 2022**

**Research Intern,** *re\*THINK Enterprise*

- Worked on knowledge graphs, ML & data integration in the domain of business transformation
- Designed, implemented & evaluated a user-assisted automatic & fully functional pipeline to convert unstructured client requirements textual data into a contextualized knowledge graph

**General Electric Global Research;** Niskayuna, NY, USA (online)

**May - Aug 2021**

**Research Fellow Intern,** *Analytics Software & Knowledge Discovery*

- Worked at the Artificial Intelligence Technical Domain
- Designed, implemented & evaluated an infrastructure for an automated generation of classification & annotation rules for control concepts in Cyber-physical Systems software using Inductive Logic Programming & Semantic Technologies

**Apple;** Herzliya, Israel

**Jan - Jun 2018**

**Embedded Firmware Engineer,** *Flash Storage Software Department*

- Designed & developed complex software modules for ultra high performance, real-time embedded systems in a multiprocessor environment for Apple products
- Defined firmware features & led HW-FW integrations
- Completed vertical integration with other modules in storage stack (i.e. drivers, file-system)

**Mellanox Technologies;** Tel Aviv, Israel

**2011 - 2017**

**Senior Firmware Engineer & Team Leader,** *Switch Silicon Core Department*

**Apr - Jun 2017**

- Managed team of 5 engineers
- Led the 100GbE Switch Systems firmware development process & software infrastructure activities - an operation involving 16 engineers
- Developed a distributed functional testing environment; debug tools & performance testing in C++ in Unix for both Ethernet & InfiniBand fabrics in OSI Data-Link & Network layers

- Implemented complex verification architectures consisting of static & dynamic analysis
- Delivered technical presentations to 50+ engineers & developers from various teams including: software, hardware, production & qualification
- Awarded for excellence & ranked “Superior” (top 5% out of 3000)

**Team Leader Firmware Engineer**, *Switch Silicon Core Department*

**May 2015 - Mar 2017**

- Managed team of 3 engineers
- Contributed to end-to-end development & defined version-release procedures for the company’s 100GbE Switch products
- Conducted personal training, code reviews; defined coding-style & methodologies of software engineering for team of 30
- Optimized shared library cross-platform code, resulting in ~40% reduction in project compilation time for 90+ department developers
- Led full silicon bring-up process, both Pre-Silicon & Post-Silicon stages
- Supervised integration processes operating in Beijing (China), Seattle & Sunnyvale (US)
- Interviewed & effectively participated in the hiring & termination of employees

**Firmware Engineer**, *Switch Silicon Core Department*

**Mar 2014 - Apr 2015**

- Developed simulation tool to reduce ~50% time in FW development cycle & customer support
- Led the planning & priorities coordination procedure with software architecture & SDK teams
- Developed “Stress” tool that has become major tool for system production/screening, power measurements & debug process

**Firmware Student**, *Switch Silicon Core Department*

**Oct 2011 - Feb 2014**

- Developed ANSI-C compiler-specific code to run on Switch Systems RISC
- Managed continuous support & optimization in Switch System Python-based regression scripts
- Implemented cross-platform error-injection tool used by both software departments of Switch Systems & Channel Adapters
- Collaborated with chip-design & software engineers to create a Post-Silicon Random Verification Environment for the 56GbE & EDR (100Gbps Infiniband) technologies

**HP Autonomy (Virage)**; Cambridge, MA, USA

**May - Aug 2009**

**Computer-Science Research Intern**, *Advanced Technology Group*

- Studied Statistical Natural Language Processing, Automatic Speech Recognition & Machine Learning; performed model training & testing with Python
- Wrote paper titled “*Improving Text-Independent Speaker Identification Performance Using Gaussian Mixture Speaker Models*” under direction of Dr. David Palmer (HP Autonomy (Virage), Inc)
- Conducted on-campus coursework in scientific theory & off-campus work in scientific research over 6 weeks under sponsorship of the Center for Excellence in Education & MIT as part of the Research Science Institute (RSI)

## TEACHING EXPERIENCE

**University of Southern California**; Los Angeles, CA, USA

**Spring & Fall 2020**

**Teaching Assistant**, *DSCI 558: Building Knowledge Graphs*

- Designed & evaluated course examinations, written bi-weekly assignments & weekly quizzes
- Held weekly office hours (2 hours each)
- Designed & delivered 3+ sessions of complete (2 hours) lectures (includes core-material classes & guest lectures)

## AWARDS & SCHOLARSHIPS

**University of Southern California**; Los Angeles, CA, USA

**2022**

*University Outstanding Teaching Assistant Award (Highest Achievement, grant valued \$1k)*

**Alexa Prize Socialbot Grand Challenge 4**; Seattle, WA, USA

**2021**

*Our team was the recipient of a research grant valued \$250k as part of the competition*

**Modeling and Managing Complicated Systems Institute**; Pittsburgh, PA, USA

**2019**

*Recipient of the Ford Foundation Graduate Student Grant (value \$1.6k)*

**Tel Aviv University**; Tel Aviv, Israel

**2013**

*Faculty Dean’s List of Outstanding Undergraduate Students*

**Tel Aviv University**; Tel Aviv, Israel

**2013**

*Recipient of the Freescale Semiconductor Israel Excellence Scholarship (value \$1.2k)*

SELECTED  
PUBLICATIONS

**B. Shbita** and C. A. Knoblock. Automatically Constructing Geospatial Feature Taxonomies from OpenStreetMap Data. In *2024 IEEE 18th International Conference on Semantic Computing (ICSC)*, (208–211). IEEE, 2024.

Y. Chiang, M. Chen, W. Duan, J. Kim, C. A. Knoblock, S. Leyk, Z. Li, F. Lin, M. Namgung, **B. Shbita**, and J. H. Uhl. GeoAI for the Digitization of Historical Maps. In *Handbook of Geospatial Artificial Intelligence*, (217–247). CRC Press, 2023.

F. Lin, C. A. Knoblock, **B. Shbita**, B. Vu, Z. Li, and Y. Chiang. Exploiting Polygon Metadata to Understand Raster Maps: Accurate Polygonal Feature Extraction. In *Proceedings of the 31st ACM International Conference on Advances in Geographic Information Systems*, (1–12). 2023.

**B. Shbita**, A. L. Gentile, C. Deluca, P. Li, and G. Ren. Understanding Customer Requirements – An Enterprise Knowledge Graph Approach. In *Extended Semantic Web Conference*, (625–643). Springer Nature Switzerland, 2023.

**B. Shbita**, C. A. Knoblock, W. Duan, Y. Chiang, J. H. Uhl, and S. Leyk. Building Spatio-Temporal Knowledge Graphs from Vectorized Topographic Historical Maps. In *Semantic Web*, 14(3), (pp. 527–549). IOS Press, 2023.

**B. Shbita**, and A. Moitra. Automated Generation of Control Concepts Annotation Rules Using Inductive Logic Programming. In *Functional and Logic Programming*, (pp. 171-185). Springer, 2022.

H. Cho, **B. Shbita**, K. Shenoy, S. Liu, N. Patel, H. Pindikanti, J. Lee, and J. May. Viola: A Topic Agnostic Generate-and-Rank Dialogue System. In *Proceedings of the 4th Alexa Prize*, 2021.

**B. Shbita**, C. A. Knoblock, W. Duan, Y. Chiang, J. H. Uhl, and S. Leyk. Building Linked Spatio-Temporal Data from Vectorized Historical Maps. In *Extended Semantic Web Conference*, (pp. 409–426). Springer, 2020.

Z. Li, Y. Chiang, S. Tavakkol, **B. Shbita**, J. H. Uhl, S. Leyk, and C. A. Knoblock. An Automatic Approach for Generating Rich, Linked Geo-Metadata from Historical Map Images. In *Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining* (pp. 3290-3298). 2020.

**B. Shbita**, B. Vu, D. Feldman, M. Pham, A. Rajendran, C. A. Knoblock, J. Pujara, and Y. Chiang. Creating a FAIR Data Catalog to Support Scientific Modeling. In *Workshop on Advanced Knowledge Technologies for Science in a FAIR World*, 2019.

**B. Shbita**, A. Rajendran, J. Pujara, and C. A. Knoblock. Parsing, Representing and Transforming Units of Measure. In *Modeling the World’s Systems*, 2019.

ACADEMIC  
SERVICE

<b>Program Committee</b> (Industry track), International Semantic Web Conference (ISWC)	<b>2023</b>
<b>Reviewer</b> (Research & In-use tracks), International Semantic Web Conference (ISWC)	<b>2023</b>
<b>Program Committee</b> (Industry track), International World Wide Web Conference (WWW)	<b>2023</b>
<b>Program Committee</b> (Industry track), International Semantic Web Conference (ISWC)	<b>2022</b>
<b>Reviewer</b> (Research track), International Semantic Web Conference (ISWC)	<b>2022</b>
<b>Reviewer</b> , International Joint Conference on Knowledge Graphs (IJCKG)	<b>2021</b>

LANGUAGES

English • Arabic • Hebrew • Russian

TECHNICAL  
SKILLS

Python, C, C++, C#, SWI-Prolog, MATLAB, Assembly • RDF/OWL, SPARQL, SQL, PostgreSQL, PostGIS  
• PyTorch, TensorFlow, Keras, scikit-learn, pandas, SciPy, NumPy, Matplotlib, Jupyter, Flask  
• Ruby on Rails, HTML, CSS, JavaScript • Git • Docker