Basel Shbita, **he/him/his**

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 • Information Extraction • Information Integration • Semantic Web

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: 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, 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*, (Preprint), pp.1-23. 2022.

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.

J. H. Uhl, S. Leyk, Z. Li, W. Duan, **B. Shbita**, Y. Chiang, and C. A. Knoblock. Combining Remote-Sensing-Derived Data and Historical Maps for Long-Term Back-Casting of Urban Extents. *Remote Sensing, 13(18), 3672*, 2021.

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 *European 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

Program Committee (Industry track), International World Wide Web Conference (WWW) **2023**
Program Committee (Industry track), International Semantic Web Conference (ISWC) **2022**
Reviewer (Research track), International Semantic Web Conference (ISWC) **2022**
Reviewer, International Joint Conference on Knowledge Graphs (IJCKG) **2021**

EXTRACURRICULAR ACTIVITIES

Kosmic Kamels at Burning Man; Black Rock City, NV, USA **2019 - 2022**

- Co-formed (2019) & led (2022) a collective with a mission to create new possibilities for engineers, artists, entrepreneurs, and activists from SWANA (South West Asia-North Africa)

Midburn: Burning Man Regional Organization; Negev, Israel **2016 - 2018**

- Supervised art installation procedures
- Contributed code to development of "Dreams", an open-source platform to help community plan co-created events

Tira Academics: Students Volunteering Association; Tira, Israel **2013 - 2017**

- Co-initiated association to expand academic opportunities for freshmen & high-school students
- Tutored freshmen engineering students, provided 1-on-1 guidance with Algebra, Calculus, C/Python programming & conducted workshops on a quarterly basis

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`