Tomer Libal

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Summary

- I am a researcher, instructor and software engineer with extensive experience both in the industry and the academy. My academic specialization is in higher-order unification, proof certification, formal verification and theorem proving with emphasize on legal reasoning. I have experience in teaching of university level courses and have held a management position as a lead developer in a successful technology company.
- **Research Topics:** Automated Deduction, Proof Transformation, Legal Informatics and Formal Verification
- **Teaching:** Computer and Data Sciences

Experience

- **The American University of Paris** — Paris, France
  Assistant Professor for Computer Science — *from Sep. 2017*
  - Lecturer during the academic year 2016-2017
  - Teaching courses on data mining, web development, software engineering, programming and other topics
  - Current research on proof assistants and legal informatics
- **Prosecco Team - Microsoft Research - Inria Joint Center** — Paris, France
  Research Engineer — *Jan. 2017 – Jul. 2017*
  - Research on type checkers
  - Ocaml and F* developer in the F* project
- **Parsifal Team - École Polytechnique/Inria** — Palaiseau, France
  Researcher — *Jan. 2015 – Dec. 2016*
  - Research on proof certification and unification on ERC advanced grant ProofCert
  - λProlog, Prolog, Ocaml and Scala developer in the Checkers and Leo-III teams
  - Reference: Dale Miller, head of the group
- **École Polytechnique** — Palaiseau, France
  Teaching Assistant — *Mar. 2015 – Aug. 2016*
  - Principles of Programming Languages (INF321) Undergraduate course, Spring 2015, 2016
  - Computational Logic (INF551) Master course, Fall 2015
  - Supervision of student projects and interns
- **Microsoft Research - Inria Joint Center** — Palaiseau, France
  Researcher — *Oct. 2012 – Dec. 2014*
  - Research on theorem provers and proof assistants for the TLA+ proof language
  - Modeling and verifying real time systems using the TLA Proof Assistant and Model Checker
  - Ocaml and Java developer in the TLA+ Proof System project
  - Reference: Leslie Lamport, head of the group
- **Theory and Logic Group - Vienna University of Technology** — Vienna, Austria
  Project Assistant — *Nov. 2008 – Sep. 2012*
  - Researching algorithms for higher-order unification and resolution
  - C, C++ and Scala developer in the Generic Architecture for Proofs project
  - Reference: Alexander Leitsch, head of the group
- **Quigo Technologies** — Tel Aviv, Israel and New York, USA
  Programming Team Lead — *Sep 2001 – Jan 2006*
  - In charge of a Big Data team developing search marketing solutions
  - In charge of all the company database integration development, HTTP server side development, software deployment and continuous integration
  - The company was merged[1] into AOL
- **Various Companies** — Jerusalem, Israel
  Java Programmer — *1998 - 2001*
  - Surfnotes and VerticalNet Solutions
  - Was employed as an OOP consultant to a formal text book used by computer students in Israel

[1] http://techcrunch.com/2007/11/07/aol-buys-quigo-confirmed/

Education

- **Vienna University of Technology** — Vienna, Austria
  Ph.D. in Computer Sciences — *2008 – 2012*
  - Ph.D. Thesis - Unification in Higher-order Resolution
- **Vienna University of Technology** — Vienna, Austria
  M.Sc in Computer Sciences — *2006 – 2008*
  - Master Thesis: Cut Elimination in Inductive Proofs of Weakly Quantified Theorems
- **The Hebrew University** — Jerusalem, Israel
  B.Sc in Computer Sciences — *1998 – 2001*

Academic Activities and Awards

- Collaboration with and visits to Christoph Benzmüller's research group, FU Berlin
- Visiting researcher in Van der Torre's group in the university of Luxembourg
- Was awarded the Erasmus Mundus scholarship for the European MSc programme Computational Logic for the academic years 2006-2007 and 2007-2008
- Reviewer for JAR, Organon F, CADE and various workshops, AEC member of POPL 2017 and PC member of Tableaux 2019 and PxTP 2017
- Invited talks in the EMCL workshop and in dedicated seminars in Universite Paris Diderot, Universite Savoie-Mont Blanc, ENS Cachan and others
- Thesis supervision of one master and three bachelor students

Software

- The original creator and a lead developer of the GAPT framework. ∼100k lines of Scala code.
- The original creator and a lead developer of the NAI normative reasoner. ∼15k lines of JavaScript code.
- A lead developer of the Checkers proof checker. ∼2k lines of Prolog code and shell scripts.
- A lead developer of Quigo's FeedPoint tool and a major contributor to Quigo's AdSonar tool. ∼150k lines of Java code.
- A major contributor to the TLA+ Proof System. ∼37k lines of OCaml code.
- A minor contributor to the F* language. ∼300k lines of OCaml, F# and F* code.
- A minor contributor to the Leo III theorem prover. ∼30k lines of Scala code.
- Various tools for education and research in different programming languages.

Teaching

- Intro to Web Authoring. FA16, FA17, FA18, SP19, FA19.
- Database Applications. FA16, FA18.
- Software Engineering. FA16, SP18.
- Advanced Java Programming. SP17, SP18, SP19.
- Data Science. FA17, SP19.
- Web Applications. FA17, FA19.
- The Symbolic Mind. FA18, FA19.
- Les principes des langages de programmation. SP15, SP16. (TA)
- Computational Logic: Artificial Intelligence in Mathematical Reasoning. FA15. (TA)

Publications (# of 3^{rd} party citations as of 1/7/19)

[1] T. Libal and M. Pascucci, "Automated Reasoning in Normative Detachment Structures with Ideal Conditions," 2019. ICAIL. (0).
[2] T. Libal and A. Steen, "NAI - The Normative Reasoner," 2019. ICAIL. (0).
[3] T. Libal and M. Volpe, "A general proof certification framework for modal logic," 2019. J. of MSCS. (0).
[4] T. Libal, "A Simple Semi-automated Proof Assistant for First-order Modal Logics," 2018. ARQNL. (0).
[5] T. Libal, "Implementing a Proof Assistant using Focusing and Logic Programming ," 2018. UITP. (0).
[6] T. Libal, X. Steele "Determinism in the Certification of UNSAT Proofs," 2017. PxTP. (0).
[7] T. Libal and A. Steen, "Towards a substitution tree based index for higher-order resolution theorem provers," 2016. PAAR. (1).
[8] T. Libal and M. Volpe, "Certification of prefixed tableau proofs for modal logic," 2016. GandALF. (2).
[9] S. Azaiez, D. Doligez, M. Lemerre, T. Libal and S. Merz, "Proving Determinacy of the PharOS Real-Time Operating System," 2016. ABZ. (2).
[10] T. Libal and D. Miller, "Functions-as-constructors higher-order unification," 2016. FSCD. (10).
[11] T. Libal, "Regular patterns in second-order unification," 2015. CADE. (3).
[12] R. Blanco, T. Libal and D. Miller, "Defining the meaning of TPTP formatted proofs," 2015. IWIL. (1).
[13] Z. Chihani, T. Libal, and G. Reis, "The proof certifier checkers," 2015. TABLEAUX. (7).
[14] D. Doligez, J. Kriener, L. Lamport, T. Libal, and S. Merz, "Coalescing: Syntactic abstraction for reasoning in first-order modal logics," 2015. ARQNL. (1).
[15] T. Libal, M. Riener and M. Rukhaia, "Advanced Proof Viewing in ProofTool," 2014. UITP. (7).
[16] T. Libal, "Bounded higher-order unification using regular terms," 2014. EPiC Series in Computing. (0).
[17] S. Hetzl, T. Libal, M. Riener, and M. Rukhaia, "Understanding resolution proofs through herbrand's theorem," 2013. TABLEAUX. (10).
[18] C. Dunchev, A. Leitsch, T. Libal, M. Riener, M. Rukhaia, D. Weller and B. Woltzenlogel-Paleo, "PROOFTOOL: a GUI for the GAPT Framework," 2013. UITP. (3).
[19] C. Dunchev, A. Leitsch, T. Libal, M. Riener, M. Rukhaia, D. Weller and B. Woltzenlogel-Paleo, "System feature description: Importing refutations into the gapt," 2012. PxTP. (2).
[20] C. Dunchev, A. Leitsch, T. Libal, D. Weller and B. Woltzenlogel-Paleo, "System Description: The Proof Transformation System CERES," 2010. IJCAR. (4).