

Alexander Borgida
Department of Computer Science
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Education

Ph.D., Department of Computer Science, University of Toronto, December 1977, Thesis: *Formal Studies of Stratificational Grammars*. Advisor: Professor C. Raymond Perrault

M.Sc., Department of Computer Science, University of Toronto, 1975. Thesis: “Topics in the Understanding of English Sentences by Computer”. Advisor: Professor John Mylopoulos.

Emploment History

July 2019 - present Professor Emeritus, Dept. of Computer Science, Rutgers University.

1993 - 2019 Professor, Dept. of Computer Science, Rutgers University.

1981 - 1993 Assistant and Associate Professor, Rutgers University

1979 - 1981 Lecturer/Assistant Professor, Dept. of Computer Science, University of Toronto.

2007 - 2018 Professor (status only)¹, Dept. of Computer Science, University of Toronto.

Visiting researcher ² University of Toronto, Canada; SRI, Palo Alto, USA; Stanford Knowledge Systems Labs, Palo Alto, USA; University of Waterloo, Canada; DISI, University of Trento, Italy; KRDB Center, University of Bolzano, Italy; LIG, Grenoble, France; FORTH Institue, Heraklion, Greece.

Professional Activities

(a) Editorial Board Membership

1. *Journal of Applied Ontology*, IOS Press. 2014 - present
2. *Journal of Data Semantics*, Springer Verlag. 2006 – 2021
3. *International Journal of Intelligent Information Systems*, Kluwer Academic Publishers. 1992 – present
4. *International Journal of Cooperative Information Systems*, World Scientific Publishing Co. 1992 - present
5. *Automated Software Engineering*, Kluwer Academic Publishers. 1994 – 2020

¹This is the Toronto name for adjuncts who do not teach, are not paid, but are members of the graduate faculty, and can advise Phd students and participate in committees.

²Often multiple times.

6. *Journal of Artificial Intelligence Research*, 2004 – 2008
7. *ACM Transactions on Information Systems*, ACM Press. 1995 – 2002
8. *Electronic Transactions on Artificial Intelligence*; 1998 – 2002

(b) Recent Service on International Conference and Workshop Program Committees³:

- 2021 **IJCAI’21, KR’21, ISWC’21**, XLoKR21, DL’21
- 2020 **IJCAI’20, KR’20, ISWC’20, CAiSE’20**, DL’20,
- 2019 **IJCAI’19, ISWC’19**, DL’19
- 2018 **AAAI’18, IJCAI’18, WWW’18**

1 PhD students (co*)advised:

- William Cohen (Machine Learning). Director, Research Engineering, Google AI, Pittsburgh. (Formerly Full Professor, Carnegie Mellon University; researcher at Bell Labs)
- Prem Devanbu (Software Engineering). Full Professor, UC Davis. (Formerly at Bell Labs)
- Deborah McGuinness (Semantic Web). Tetherless World Senior Constellation Professor, Rensealler Polytechnic Institute (Formerly Stanford Knowledge Systems Lab and Bell Labs)
- Mukesh Dalal. Serial entrepreneur and Chief AI officer at Black&Becker. (Formerly at Columbia University, BEA, Bose Systems.)
- Yuan An⁴ (Semantic technologies, and medical informatics.) Associate Professor, Drexel University.
- Lei Jiang³ (Data quality.) Government of Canada
- Neil Ernst³ (Software Engineering.) Assistant Professor, University of Victoria, Canada. (Formerly at Software Engineering Institute, Carnegie Mellon University.)

2 Publications

Publications since 2018

- Yehia Elrakaiby, Alexander Borgida, Alessio Ferrari, John Mylopoulos: “CaRE: a refinement calculus for requirements engineering based on argumentation theory.” *J. Softw. Syst. Model. (SoSyM)* 21(6): 2113-2132 (2022)
- Alexander Borgida, Enrico Franconi, David Toman, Grant E. Weddell: “Understanding Document Data Sources Using Ontologies with Referring Expressions.” *Proc. AI 2022*: 367-380
- Alexander Borgida, Enrico Franconi, David Toman, Grant E. Weddell: “Accessing Document Data Sources using Referring Expression Types. *Description Logics 2022*
- Varvara Kalokyri, Alexander Borgida, Amlie Marian: “Supporting Human Memory by Reconstructing Personal Episodic Narratives from Digital Traces.”, *Proc. ICWSM 2022*: 453-464

³Highly competitive conferences in their sub-field are in bold-face

⁴(U.Toronto)

- Manolis Koubarakis, Alexander Borgida, Panos Constantopoulos, Martin Doerr, Matthias Jarke, Manfred A. Jeusfeld, John Mylopoulos, Dimitris Plexousakis: “A retrospective on Telos as a metamodeling language for requirements engineering.” *J. Requir. Eng.* 26(1): 1-23 (2021)
- Yehia Elrakaiby, Alexander Borgida, Alessio Ferrari, John Mylopoulos: “A Refinement Calculus for Requirements Engineering Based on Argumentation Theory.” *Proc. ER 2020*: 3-18
- Daniela Vianna, Varvara Kalokyri, Alexander Borgida, Thu D. Nguyen, Amlie Marian: “Searching Heterogeneous Personal Digital Traces”. *Proceedings of the Association for Information Science and Technology 56.1 (2019)*: 276-285.
- Alexander Borgida: “Initial Steps Towards a Family of Regular-Like Plan Description Logics.” *Description Logic, Theory Combination, and All That* (2019): 90-109
- Alexander Borgida, Varvara Kalokyri, Amlie Marian: “Description Logics and Specialization for Structured BPMN.” *Business Process Management Workshops 2019*: 19-31
- Alexander Borgida. “Initial steps towards a family of regular-like plan description logics.” in *Description Logic, Theory Combination, and All That*, C. Lutz et al eds., Springer 2019: 90-109.
- Alexander Borgida, David Toman, Grant Weddell: “On Special Description Logics for Processes and Plans”. *Proc. Description Logic Workshop <http://ceur-ws.org/Vol-2373/>*, Oslo, Norway, June 2019.
- Varvara Kalokyri, Alexander Borgida, Amlie Marian: “YourDigitalSelf: A Personal Digital Trace Integration Tool.” *CIKM 2018*: 1963-1966
- Stephanie McIntyre, Alexander Borgida, David Toman, Grant E. Weddell: “On Limited Conjunctions and Partial Features in Parameter-Tractable Feature Logics.” *AAAI 2019*: 2995-3002
- Stephanie McIntyre, Alexander Borgida, David Toman, Grant E. Weddell: “On Limited Conjunctions in Polynomial Feature Logics, with Applications in OBDA”. *Proc. KR 2018*: 655-656
- Alexander Borgida: “Description Logics.” *Encyclopedia of Database Systems* (2nd ed.) 2018
- Alexander Borgida, Marco A. Casanova, Alberto H. F. Laender: “Logical Database Design: From Conceptual to Logical Schema.” *Encyclopedia of Database Systems* (2nd ed.) 2018
- Alexander Borgida, John Mylopoulos: “Conceptual Schema Design.” *Encyclopedia of Database Systems* (2nd ed.) 2018

Publications with over 400 citations according to Scholar Google (Over 13,000 citations in all)

1. J.Mylopoulos, A.Borgida, M.Jarke, M. Koubarakis, “Telos: Representing Knowledge about Information Systems”, *ACM Trans. on Information Systems* 8 (4), October 1990, pp.325–362.
2. A.Borgida, R.Brachman, D.McGuinness, L.Alperin Resnick, “CLASSIC: A structural data model for objects”, *Proc. ACM SIGMOD 1989*, Portland, Oregon, June 1989, pp.56–67.
3. R. Brachman, D. McGuinness, P.F. Patel-Schneider, L.A. Resnick, “Living with CLASSIC: When and how to use a KL-ONE-like language”, in *Principles of semantic networks (J. Sowa editor)*, 401-456

4. R. Agrawal, A. Borgida, H.V. Jagadish: “Efficient management of transitive relationships in large data and knowledge bases”, *Proc. ACM SIGMOD Conf.*: 253-262
5. A. Borgida, “On the Relative Expressiveness of Description Logics and Predicate Logics”, *Artificial Intelligence Journal*, 353–367 (1996).
6. A. Borgida, L. Serafini. “Distributed description logics: Assimilating information from peer sources”, *J. of Data Semantics 1* 153-184 (2003)
7. A. Borgida: “Description Logics in Data Management”, *IEEE Trans. on Knowledge and Data Engineering*, vol.7, no.5, October 1995, pp. 671–682.

Complete List of Publications (at DBLP)

<https://dblp.uni-trier.de/pers/hd/b/Borgida:Alexander> (click on this hyperlink)

3 Some Research Topics *Pioneered* to the best of our knowledge (often with others)

AREAS:

Databases

- Exceptions in Data Bases (using on-line exception handling and persistent exception markers)
- Efficient access to large transitive relationships/IsA hierarchies using integer intervals derived from pre-order traversal With R.Agarwal, Jagadish
- Automatic mapping from Relational DB Schemas to Description Logic Ontologies With Yuan An, J. Mylopoulos, R. Miller

Software Requirements and Specification

- Knowledge Representation as basis of Software Requirements Specification With S. Greenspan, J. Mylopoulos [n-10 Best paper prize at ICSE'92]
- AI solution to the “frame problem” applied to stating that a program “modifies at most variables ...” in formal program specification With R.Reiter, J. Mylopoulos
- *Specification of services/software modules using Description Logics* With P. Devanbu

Description Logics (DLs) and Knowledge Representation

- *Extensible* Knowledge Representation and Reasoning for Description Logics (DLs)
- Defining and computing *least common generalization/subsumer* in DLs With W. Cohen, H. Hirsh
- *Loading data from Relational Databases to DLs* With R. Brachman
- Precise equivalence between DLs and First Order Logic with 3 quantified variables
- *Explanation of reasoning* in Description Logics With D. McGuinness
- *Distributed* Description Logics With L. Serafini
- *Referring expressions* in Knowledge Base and Database query answers With G.Weddel, D. Toman [Ray Reiter Best Paper prize at KR'15]