Hudson Turner

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PROFESSIONAL EMPLOYMENT

Associate Professor, University of Minnesota, Duluth, 2003–present.
Assistant Professor, University of Minnesota, Duluth, 1998–2003.
Microcomputer Applications Librarian, University of Texas at Austin, 1988–1991.

EDUCATION

Ph.D. (Computer Science), University of Texas at Austin, 1998.
Thesis advisor: Vladimir Lifschitz.
Thesis title: Causal Action Theories and Satisfiability Planning.
M.S.C.S. (Computer Science), University of Texas at Austin, 1991.
M.L.I.S. (Library and Information Science), University of Texas at Austin, 1988.
B.A. Liberal Arts (English, Philosophy), University of Texas at Austin, 1984.

RESEARCH INTERESTS

Artificial intelligence. Knowledge representation.
Commonsense reasoning about actions. Automated planning.
Nonmonotonic reasoning. Logic programming.
Finite-domain satisfiability solvers.

RESEARCH STATEMENT

I work on formal methods for representing commonsense knowledge about the effects of actions. Such representations allow precise mathematical claims about descriptions of action domains, and provide a sound basis for automated reasoning about actions and change.

The "causal theories" formalism introduced and explored in several of my publications is designed for representing mathematically simple forms of causal knowledge. Notably, causal theories allow an elegant and robust solution to the longstanding "frame problem" — essentially the problem of representing the convenient commonsense assumption that things stay the same unless they are caused to change.

I also work on mathematical foundations of logic programming (under the answer set semantics) and default logic. These are widely-studied nonmonotonic logics, closely related to causal theories.

RESEARCH FUNDING

National Science Foundation CAREER Grant #0019773, 3/2001–8/2007, $381,787.

Faculty Single Semester Leave, Univ. of Minnesota, Fall 2000, semester paid leave for research.

Grant-in-Aid for Research, Artistry and Scholarship, Univ. of Minnesota, 12/1988–5/2000, $19,658.

PROGRAM COMMITTEES

Twenty-third Nat'l Conf. on Artificial Intelligence (AAAI'08)
Tenth International Symposium on Artificial Intelligence and Mathematics
Third Int'l Conf. on Automated Planning and Scheduling (ICAPS'06)
Seventeenth European Conference on Artificial Intelligence (ECAI'06)
Second Int'l Conf. on Automated Planning and Scheduling (ICAPS'05)
Twentieth Nat'l Conf. on Artificial Intelligence (AAAI'05)
Nineteenth Nat'l Conf. on Artificial Intelligence (AAAI'04)
Seventh Int'l Conf. on Logic Programming and Nonmonotonic Reasoning (LPNMR'04)
Ninth European Conf. on Logics in Artificial Intelligence (JELIA'04)
Nineteenth Int'l Conf. on Logic Programming (ICLP'03)
Eighteenth Nat'l Conf. on Artificial Intelligence (AAAI'02)
Ninth Int'l Workshop on Nonmonotonic Reasoning (NMR'02)
2001 AAAI Spring Symposium on Answer Set Programming
Seventeenth Nat'l Conf. on Artificial Intelligence (AAAI'00)
Eighth Int'l Workshop on Nonmonotonic Reasoning (NMR'00)
Fifth Int'l Conf. on Logic Programming and Nonmonotonic Reasoning (LPNMR'99)

PUBLICATIONS

Hudson Turner. Nonmonotonic Causal Logic. In *Handbook of Knowledge Representation*, Elsevier, edited by Frank van Hermelen, Vladimir Lifschitz, and Bruce Porter, pages 759–776, 2008.

Enrico Giunchiglia, Joohyung Lee, Vladimir Lifschitz, Norman McCain and Hudson Turner. Nonmonotonic Causal Theories. In *Artificial Intelligence* (AIJ), vol. 153, pages 49–104, 2004.

Varol Akman, Selim Erdoğan, Joohyung Lee, Vladimir Lifschitz, and Hudson Turner. Representing the Zoo World and the Traffic World in the Language of the Causal Calculator. In *Artificial Intelligence* (AIJ), vol. 153, pages 105–140, 2004.

Hudson Turner. Strong Equivalence for Causal Theories. In *Proc. of the Seventh Int'l Conf. on Logic Programming and Nonmonotonic Reasoning* (LPNMR'04), pages 289–301, 2004

Hudson Turner. Strong Equivalence Made Easy: Nested Expressions and Weight Constraints. In (Journal of) *Theory and Practice of Logic Programming* (TPLP), vol. 3(4&5), pages 609–622, 2003.

Hudson Turner. Polynomial-Length Planning Spans the Polynomial Hierarchy. In *Proc. of the Eighth European Conf. on Logics in Artificial Intelligence* (JELIA'02), pages 111–124, 2002.

Hudson Turner. Order-Consistent Programs are Cautiously Monotonic. In (Journal of) *Theory and Practice of Logic Programming* (TPLP), vol. 1(4), pages 487–495, 2001.

Hudson Turner. Strong Equivalence for Logic Programs and Default Theories (Made Easy). In *Proc. of the Sixth Int'l Conf. on Logic Programming and Nonmonotonic Reasoning* (LPNMR'01), pages 81–92, 2001.

Hudson Turner. A Logic of Universal Causation. In *Artificial Intelligence* (AIJ), vol. 113, pages 87–123, 1999.

Vladimir Lifschitz and Hudson Turner. Representing Transition Systems by Logic Programs. In *Proc. of the Fifth Int'l Conf. on Logic Programming and Nonmonotonic Reasoning* (LPNMR'99), pages 92–106, 1999.

Vladimir Lifschitz, L.R. Tang and Hudson Turner. Nested Expressions in Logic Programs. In *Annals of Mathematics and Artificial Intelligence* (AMAI), vol. 25:2,3, pages 369–390, 1999.

Norman McCain and Hudson Turner. Satisfiability Planning with Causal Theories. In *Proc. of the Sixth Int'l Conf. on Principles of Knowledge Representation and Reasoning* (KR'98), pages 212–223, 1998.

Norman McCain and Hudson Turner. Causal Theories of Action and Change. In *Proc. of the 1997 Nat'l Conf. on Artificial Intelligence* (AAAI'97), pages 460–465, 1997.

Hudson Turner. Representing Actions in Logic Programs and Default Theories: A Situation Calculus Approach. In *Journal of Logic Programming* (JLP), vol. 31(1–3), pages 245–298, 1997.

Teodor Przymusinski and Hudson Turner. Update by Means of Inference Rules. In *Journal of Logic Programming* (JLP), vol 30(2), pages 125–143, 1997.

Hudson Turner. Splitting a Default Theory. In *Proc. of the 1996 Nat'l Conf. on Artificial Intelligence* (AAAI'96), pages 645–651, 1996.

Norman McCain and Hudson Turner. A Causal Theory of Ramifications and Qualifications. In *Proc. of the 1995 Int'l Joint Conf. on Artificial Intelligence* (IJCAI'95), pages 1978–1984, 1995.

Vladimir Lifschitz and Hudson Turner. From Disjunctive Programs to Abduction. In Jürgen Dix, Luis Pereira and Teodor Przymusinski, editors, *Non-Monotonic Extensions of Logic Programming* (*Lecture Notes in Artificial Intelligence 927*), pages 23–42, Springer-Verlag, 1995.

Hudson Turner. Signed Logic Programs. In Maurice Bruynooghe, editor, *Logic Programming: Proc. of the 1994 Int'l Symposium* (ILPS'94), pages 61–75, MIT Press, 1994.

Norman McCain and Hudson Turner. Language Independence and Language Tolerance in Logic Programs. In Pascal Van Hentenryck, editor, *Proc. of the Eleventh Int'l Conf. on Logic Programming* (ICLP'94), pages 38–57, MIT Press, 1994.

Vladimir Lifschitz and Hudson Turner. Splitting a Logic Program. In Pascal Van Hentenryck, editor, *Proc. of the Eleventh Int'l Conf. on Logic Programming* (ICLP'94), pages 23–37, MIT Press, 1994.

Hudson Turner. A Monotonicity Theorem for Extended Logic Programs. In David S. Warren, editor, *Logic Programming: Proc. of the Tenth Int'l Conf. on Logic Programming* (ICLP'93), pages 567–585, MIT Press, 1993.

Papers available at `http://www.d.umn.edu/~hudson/papers.html`.

COURSES TAUGHT

Algorithms
Automata Theory
Compilers
Computational Logic (graduate)
Computer Science Theory
Computer Ethics
Theory of Computation (graduate)
Computer Science II (data structures in C++)

REFEREEING: JOURNALS

Artificial Intelligence (AIJ)
Journal of the ACM (JACM)
Journal of Artificial Intelligence Research (JAIR)
ACM Transactions on Computational Logic (TOCL)
Theory and Practice of Logic Programming (TPLP)
Theoretical Computer Science
Journal of Logic Programming (JLP)
Journal of Automated Reasoning (JAR)
Journal of Logic and Computation (JLC)
Computational Intelligence
Annals of Mathematics and Artificial Intelligence (AMAI)
Information Processing Letters

REFEREEING: CONFERENCES

Int'l Joint Conf. on Artifical Intelligence (IJCAI)
National Conf. on Artificial Intelligence (AAAI)
Int'l Conf. on Principles of Knowledge Representation and Reasoning (KR)
Int'l Conf. on Logic Programming and Non-Monotonic Reasoning (LPNMR)
Int'l Conf. on Automated Planning and Scheduling (ICAPS)
IEEE Symposium on Logic in Computer Science (LICS)
Int'l Conf. on Logic Programming (ICLP)
Int'l Logic Programming Symposium (ILPS)
European Conf. on Logics in AI (JELIA)
Int'l Workshop on Nonmonotonic Reasoning (NMR)
Portuguese Conf. on Artificial Intelligence (EPIA)
Asian Computing Science Conference
Int'l Conf. on Computer Design (ICCD)

MASTERS STUDENTS

Guoqiang Zang, graduated Summer 1999
Thesis title: From Concurrent STRIPS to Logic Programming

Xiaochun Liu, graduated Spring 2001
Thesis title: Deterministic Conformant Planning with the Causal Calculator

Zhuo Chen, graduated Fall 2002
Thesis title: Determinizing in Conformant Planning

Krishna Kotnana, graduated Summer 2003
Thesis title: Conformant Planning as QBF Satisfiability

Sweta Sinha, graduated Summer 2003
Thesis title: A Finite Domain Satisfiability Solver

Ashutosh Nagle, graduated Summer 2004
Thesis title: A Finite Domain Satisfiability Solver with Negation

Hemal Lal, graduated, Spring 2005
Thesis title: A Finite Domain Satisfiability Solver with Clause Learning and Non-Chronological Backtracking

Kai Xu, graduated Summer 2006
Project title: Determining Strong Equivalence of Causal Theories

Amine Abou-Rjeily, graduated Spring 2008
Thesis title: Solving Conformant Planning Using Chen's Determinizing Method

Ashraful Alam (uncompleted)

Anurag Jain, graduated Fall 2008
Thesis title: Watched Literals in a Finite Domain SAT Solver

Bin Lin (expected graduation Spring 2009)