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## Short CV GQ Zhang

Department of Electrical Engineering & Computer Science  
Glennan Building, Room 309  
Case Western Reserve University  
10900 Euclid Avenue, Cleveland, OH 44106

Phone: 216-368-0382  
Fax: 216-368-3123  
Email: gq@case.edu  
Web: <http://newton.case.edu>

### Research Interests

**Computer Science Foundations:** domain theory, formal languages, logic and semantics.  
**Information Retrieval:** vertical digital libraries, automated content organization and presentation.  
**Biomedical Informatics:** content management systems, concept analysis, semantic-web, cooperative ontological engineering, infrastructure studies, and medical image analysis.

### Education

**Ph.D.** in Computer Science, Cambridge University, England, 02/1990  
**M.S.** in Information Sciences, Peking University, 05/1984  
**B.S.** in Applied Mathematics, Nanjing University of Aeronautics & Astronautics, 07/1982

### Professional Experience

**07/2008 -** Full Professor, Department of Electrical Engineering and Computer Science (EECS), Case Western Reserve University (CWRU)  
**01/2007 - 06/2007** Associate Chair of Computer Science, Department of EECS, CWRU  
**01/2007 - 04/2007** Interim Department Co-Chair, Department of EECS, CWRU  
**08/2000 - 06/2008** Associate Professor, Department of EECS, CWRU  
**05/1996 - 08/2000** Associate Professor (tenured), Dept. Computer Science, University of Georgia  
**08/1998 - 05/1999** Visiting Associate Professor, Department of EECS, CWRU  
**07/1991 - 07/1993** Visiting Assistant Professor, AI Lab., University of Michigan, Ann Arbor  
**09/1989 - 05/1996** Assistant Professor, Department of Computer Science, University of Georgia  
(*on unpaid leave from 1991 to 1993 at The University of Michigan*)

### Software Systems (as PI/PM)

**02/2003 - 12/2005** *EECS Web Development*  
**08/2004 - present** *Vertical Digital Library Portals*  
**06/2005 - present** *MIMI – Multi-modality, Multi-resource, Information Integration environment*  
**08/2007 - present** *Informatics Initiative at Case Comprehensive Cancer Center (Case CCC)*

**Publications** (Underlined are students having Dr. Zhang as the major research advisor)

### **Fully Refereed Journals**

1. J. Szymanski, D.W. Wilson, G.-Q. Zhang, MIMI: an integrated information management system for biomedical core facilities, **Journal of Digital Imaging**, (In Press).
2. A. Troy and GQ Zhang. Beyond PubMed and Google Scholar: using vertical digital library portals to enhance exploratory biomedical literature mining. Special Issue on Bioinformatics, International Journal of Computational Science (In Press; Invited Paper).
3. G.-Q. Zhang, Mediating secure information flow policies, **Information and Computation** Vol. 205, pages 1413-1425, 2007.

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4. Y. Jiang and G.-Q. Zhang. Weakly distributive domains (II), **Springer Journal of Frontiers of Computer Science in China**, Vol 4, 373-384.
  5. G. Chen, J.-H. Choi, B. Song, J. Szymanski, G.-Q. Zhang, A. Tung, J. Kang, S. Kim, J. Yang, ARCS: aggregated related column scoring scheme for aligned sequences, **Bioinformatics**, Vol. 22(19), pages 2326-2332, 2006.
  6. G.-Q. Zhang and G. Shen, Approximable concepts, Chu spaces, information systems, In V. De Paiva and V. Pratt (edts.), **Theory and Applications of Categories**, Special Issue on Chu Spaces, Vol. 17, No. 5, pages 80-102, 2006.
  7. P. Hitzler, M. Krötzsch, G.-Q. Zhang, Categorical view on algebraic lattices in Formal Concept Analysis, **Fundamenta Informaticae**, Vol. 74 (2-3), pages 301-328, 2006.
  8. J. Stuckman and G.-Q. Zhang, Mastermind is NP-complete, **INFOCOMP Journal of Computer Science**, Vol. 5, pages 25-28, 2006.
  9. Y. Chen and G.-Q. Zhang, Maximality and totality of stable functions in the category of stable bifinite domains, **Computational Mathematics with Applications**, Vol. 51, pages 1011-1020, 2006.
  10. G.-Q. Zhang and Y. Jiang, On an open problem of Amadio and Curien: the finite antichain condition, **Information and Computation**, Vol. 202, pages 87-103, 2005.
  11. G.-Q. Zhang and W. Rounds, Reasoning with power defaults, **Theoretical Computer Science**, Vol. 323/1-3, pages 321-350, 2004.
  12. T. Coquand and G.-Q. Zhang, A representation of stably compact spaces, and patch topology, **Theoretical Computer Science**, Vol. 305, pages 77-84, 2003.
  13. M. Droste and G.-Q. Zhang, On transformations of formal power series, **Information and Computation**, Vol. 184, pp 369-383, 2003.
  14. G.-Q. Zhang, Domain mu-calculus, **Theoretical Informatics and Applications**, Vol. 37, pages 337-364, 2003.
  15. G.-Q. Zhang, Logic, semantics and computer science: some fundamental ideas, **Advances in Mathematics**, Vol. 31, pages 389-402, 2002.
  16. W. Rounds and G.-Q. Zhang, Clausal logic and logic programming in algebraic domains, **Information and Computation**, Vol. 171, pages 183-200, 2001.
  17. G.-Q. Zhang and Y. Chen, Domains via graphs, **J. Computer Science and Tech.**, Vol. 16, pages 505-521, 2001.
  18. G.-Q. Zhang, Automata, Boolean matrices, and ultimate periodicity, **Information and Computation**, Vol. 152, pages 138-154, 1999.
  19. I. Castellani and G.-Q. Zhang, Parallel product of event structures, **Theoretical Computer Science**, Vol. 179, pages 203-215, 1997.
  20. G.-Q. Zhang and W. Rounds, Defaults in domain theory, **Theoretical Computer Science**, Vol. 177, pages 155-182, 1997.
  21. G.-Q. Zhang and E. Canfield, The end of pumping, **Theoretical Computer Science**, Vol. 174, pages 275-279, 1997.
  22. W. Rounds and G.-Q. Zhang, Logical considerations of default semantics, **Annals of Mathematics and Artificial Intelligence**, Vol. 20, pages 195-226, 1997.
  23. G.-Q. Zhang and W. Rounds, Nonmonotonic consequences of default domain theory, **Annals of Mathematics and Artificial Intelligence**, Vol. 20, pages 227-265, 1997.
  24. G.-Q. Zhang, The largest cartesian closed category of stable domains, **Theoretical Computer Science**, Vol. 166, pages 203-219, 1996.
  25. G.-Q. Zhang, Quasi-prime algebraic domains, **Theoretical Computer Science**, Vol. 155, pages 221-264, 1996.
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26. W. Rounds and G.-Q. Zhang, Domain theory meets default logic, **Journal of Logic and Computation**, Vol. 5, pages 1-25, 1995.
  27. G.-Q. Zhang, Maximal stable functions, **Theoretical Computer Science**, Vol. 146, pages 331-339, 1995.
  28. G.-Q. Zhang, A representation of SFP, **Information and Computation**, Vol. 110, pages 233-263, 1994.
  29. G.-Q. Zhang, Some monoidal closed categories of stable domains and event structures, **Mathematical Structures in Computer Science**, Vol. 3, pages 259-276, 1993.
  30. G.-Q. Zhang, DI-domains as prime information systems, **Information and Computation**, Vol. 100, pages 151-177, 1992.
  31. G.-Q. Zhang, Stable neighborhoods, **Theoretical Computer Science**, Vol. 93, pages 143-157, 1992.
  32. G.-Q. Zhang, NP-completeness and restricted partitions, **Information Sciences**, Vol. 32, pages 231-242, 1984.

### Monograph, Edited Books, Book Chapters

1. G.-Q. Zhang, J. Lawson, Y. Liu, M.-K. Lou (eds), *Domain Theory, Logic, and Computation*, Springer-Verlag, ISBN 1-4020-1832-0, 2004.
2. K. Keimel, G.-Q. Zhang, Y. Liu, and Y. Chen (eds), *Domains and Processes*, Springer-Verlag, ISBN 0-7923-7143-7, 2001.
3. G.-Q. Zhang and W. Rounds, Semantics of logic programs and representation of Smyth powerdomain, Chapter 9 in Keimel et. al. (eds.), *Domains and Processes*, Springer-Verlag, pages 151-181, 2001.
4. W. Rounds and G.-Q. Zhang, Attunement to constraints in nonmonotonic reasoning, Chapter 32 in Seligman and Westerstahl (eds.), *Logic, Language, and Computation*, pages 479-494, CSLI Publication, Stanford, CA, 1996.
5. G.-Q. Zhang, *Logic of Domains*, Research Monograph in series *Progress in Theoretical Computer Science*, Birkhauser, Boston ISBN 0-8176-3570-X, 259 pages, 1991.

### Fully Refereed Conference Proceedings

1. F.P. Huang, M. Droste and GQ Zhang. A monoidal category of bifinite Chu spaces. *Electronic Notes in Theoretical Computer Science* (In Press).
2. A. Troy and G.-Q. Zhang, Enhancing relevance scoring with chronological term rank, Proc. 30th Ann. Int. Association for Computing Machinery (ACM) Special Interest Group on Information Retrieval Conference (**SIGIR'07**), ACM Press, pages 599-606, 2007.
3. M. Droste and G.-Q. Zhang, Bifinite Chu spaces, Proc. 2nd Conf. Algebra and Coalgebra in Computer Science (**CALCO'07**), Springer Lecture Notes in Computer Science (LNCS), Vol. 4624, pages 179-193, 2007.
4. A. Troy, G.-Q. Zhang, Y. Tian, Faster concept analysis, Proc. 15th International Conference on Conceptual Structures (**ICCS'07**), Springer Lecture Notes in Artificial Intelligence, Vol. 4604, pages 206-219, 2007.
5. Y. Jiang and G.-Q. Zhang, Weakly distributive domains, Proc. 8th Conference on Typed Lambda Calculi and Applications (**TLCA'07**), Springer Lecture Notes in Computer Science, Vol. 4583, pages 194-206, 2007.

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6. G.-Q. Zhang, A. Troy, K. Bourgojn, Bootstrapping ontology learning for information retrieval using formal concept analysis, Proc. 14th International Conference on Conceptual Structures (**ICCS'06**), 15 pages, 2006.
  7. G.-Q. Zhang, G. Shen, Y. Tian, J. Sun, Concept analysis as a formal method for menu design, Proc. 12th International Workshop on Design, Specification and Verification of Interactive Systems (**DSVIS'06**), LNCS, Vol. 3941, pages 173-187, 2006.
  8. A. Troy, M. Mehregany, G.-Q. Zhang, Evolution of the Hilton Head Workshop community, Education Tech. Digest of Sensors, Actuators and Microsystems Workshop, 4 pages, 2006.
  9. M. Kröetzsch, P. Hitzler, G.-Q. Zhang, Morphisms in context, Proc. 13th International Conference on Conceptual Structures (**ICCS'05**), Springer-Verlag Lecture Notes in Artificial Intelligence, Vol. 3596, pages 223-237, 2005.
  10. G.-Q. Zhang and Y. Tian, ACOSys: an experimental system for automated content organization, Common Semantics for Sharing Knowledge: Supp. Proc. 13th Int. Conf. Conceptual Structures (**ICCS'05**), Kassel University Press, pages 186-198, 2005.
  11. G.-Q. Zhang, J. Staiger, G. Shen, A. Troy, J. Sun, FcAWN - concept analysis as a formal method for automated web-menu design, Supp. proc. 12th International Conference on Conceptual Structures (**ICCS'04**), In Pfeiffer Wolff and Delugach (Eds.) Conceptual Structures at Work, Shaker Verlag, pages 141-145, 2004.
  12. P. Hitzler and G.-Q. Zhang, A cartesian closed category of approximating concepts. Proc. 12th International Conference on Conceptual Structures (**ICCS'04**), Springer-Verlag Lecture Notes in Artificial Intelligence, Vol. 3127, pages 170-185, 2004.
  13. G.-Q. Zhang, Compact coverage generates spectral frames, In Brookes and Panagaden (eds.), Proc. 19th Conference on the Mathematical Foundations of Programming Semantics (**MFPS'03**), Elsevier Electronic Notes in Computer Science, Vol. 83, 8 pages, 2003.
  14. G.-Q. Zhang, Chu spaces, formal concepts, and domains, In Brookes and Panagaden (eds.), Proc. 19th Conf. Mathematical Foundations of Programming Semantics (**MFPS'03**), Elsevier Electronic Notes in Computer Science, Vol. 83, 16 pages, 2003.
  15. G.-Q. Zhang, Axiomatic aspects of default inference, Proc. Workshop on Paraconsistent Computational Logic, pages 17-32, 2002.
  16. G.-Q. Zhang, Decidable fragments of domain mu-calculus: an automata-theoretic perspective, Proc. Conference on Fixed Points In Computer Science, pages 54-57, 2002.
  17. M. Droste and G.-Q. Zhang, Rational transformations of formal power series, Proc. 28th Ann. European Assoc. Theoretical Computer Science Int. Coll. on Automata, Languages and Programming (**ICALP'01**), Springer Lecture Notes in Computer Science, Vol. 2076, pages 555-566, 2001.
  18. G.-Q. Zhang and L. Smith, A collection of functional libraries for theory of computation, Proc. 39th ACM-SE Conference, ACM Press, pages 83-90, 2001.
  19. T. Coquand and G.-Q. Zhang, Sequents, frames, and completeness, Proc. European Logic Assoc. Ann. Conf. Computer Science Logic (**CSL'00**), Springer-Verlag Lecture Notes in Computer Science, Vol. 1862, pages 277-291, 2000.
  20. E. Klavins, W. Rounds, G.-Q. Zhang, Experimenting with power default reasoning, Proc. 15th Ann. Conf. Amer. Assoc. Artificial Intelligence (**AAAI'98**), pages 846-852, 1998.
  21. G.-Q. Zhang and W. Rounds, Complexity of power default reasoning, Proc. 12th Ann. Institute of Electrical and Electronics Engineers (IEEE) Symposium on Logic in Computer Science (**LICS'97**), pages 328-339, 1997.
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22. G.-Q. Zhang and W. Rounds Power defaults, Proc. 4th Int. Conf. Logic programming and Non-monotonic Reasoning, Springer-Verlag Lecture Notes in Computer Science, Vol. 1265, pages 152-169, 1997.
  23. G.-Q. Zhang, W. Rounds, C. Huang, A modal logic for reasoning about belief, Proc. 30th Hawaii Int. Conf. System Sciences, Vol. 5, pages 383-391, 1997.
  24. G.-Q. Zhang, W. Rounds, Resolution in the Smyth powerdomain, Proc.13rd Int. Conf. Mathematical Foundations of Programming Semantics (**MFPS'97**), Elsevier Electronic Notes in Theoretical Computer Science, Vol. 6, 14 pages, 1997.
  25. G.-Q. Zhang, Universal quasi-prime algebraic domains, Proc. 9th Int. Conf. Mathematical Foundations of Programming Semantics (**MFPS'94**), Springer-Verlag Lecture Notes in Computer Science, Vol. 802, pages 454-473, 1994.
  26. W. Rounds and G.-Q. Zhang, Constraints in non-monotonic reasoning, Proc. 1st Workshop on *Principles and Practice of Constraint Programming*, Brown University, 1993.
  27. G.-Q. Zhang, Disjunctive systems and L-domains, Proc. 19th Ann. European Assoc. of Theoretical Computer Science Int. Coll. Automata, Languages and Programming (**ICALP'92**), Springer-Verlag Lecture Notes in Computer Science, Vol. 623, pages 284-295, 1992.
  28. G.-Q. Zhang, A monoidal closed category of event structures, Proc. 7th International Conference on the Mathematical Foundations of Programming Semantics (**MFPS'91**), Springer-Verlag Lecture Notes in Computer Science, Vol. 598, pages 426-435, 1991.
  29. G.-Q. Zhang, DI-domains as information systems, Proc. 16th Ann. European Assoc. Theoretical Computer Science Int. Coll. Automata, Languages and Programming (**ICALP'89**), Springer-Verlag Lecture Notes in Computer Science, Vol. 372, pages 773-788, 1989.

### **Editorship and Program Committees Served**

- Bookseries Editor-in-Chief, Chapman&Hall CRC Series, *Studies in Informatics*, 2006 - present.
- Program Committee Co-Chair, OCCBIO: Ohio Collaborative Conference on Bioinformatics, 06/2009.
- Member of AMIA Finance Committee, 2008 - present.
- Steering Committee Chair, FICS: International Conference on Foundations of Informatics, Computing, and Software, 2006 - present.
- Member of Steering Committee, OCCBIO: Ohio Collaborative Conference on Bioinformatics, 2007 - present.
- Bookseries Editor-in-Chief, Semantic Struct. Comput., Springer-Verlag, 2000-2006.
- Member of Program Committee, ICCS08: 16th International Conference on Conceptual Structures, Toulouse, France, July 7-11, 2008.
- Member of Program Committee, FAInt 2007: Foundations of Artificial Intelligence Workshop at KI 2007, Germany, 09/2007.
- Member of Program Committee, AST 2007: 2nd International Workshop on Applications of Semantic Technologies, Bremen, Germany, 09/2007.
- Member of Program Committee, ICCS07: 15th International Conference on Conceptual Structures, Sheffield, England, 07/2007.
- Member of Program Committee, AST 2006: 1st International Workshop on Applications of Semantic Technologies, Dresden, Germany, 10/2006.
- Member of Program Committee, ICCS06: 14th International Conference on Conceptual Structures, Aarborg, Denmark, 07/2006.
- Program Committee Co-Chair, the 4th International Symposium on Domain Theory, Hunan, China, 06/2006.

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- Member of Program Committee, Foundational Aspects of Ontologies, Workshop at 28th German Conference on Artificial Intelligence, Koblenz, Germany, 09/2005.
  - Member of Program Committee, the 13th International Conference on Conceptual Structures, Kassel, Germany, 07/2005.
  - Member of Program Committee, the 3rd International Conference on Formal Concept Analysis, Lens, France, 02/2005.
  - Program Committee Co-Chair, the 3rd International Symposium on Domain Theory, Xi'an, China, 05/2004.
  - Member of Program Committee, the 19th International Conference on the Mathematical Foundations of Programming Semantics, Canada, 03/2003.
  - Member of Program Committee, the 4th Congress of Logic Applied to Technology, Brazil, 11/2003.
  - Member of Program Committee, the 3rd Congress of Logic Applied to Technology, Brazil, 11/2002.
  - Program Committee Co-Chair, the 2nd International Symposium on Domain Theory, Sichuan, China, 09/2001.

### **Honors and Awards**

- Best Poster Award, The ImTK Consortium for *Multicenter Image Management*, St. Louis, Missouri, 2007
- NIH K25 Award, 2005-2009
- Selection Panel, Science Foundation Ireland, 2005, 2006, 2007
- Panelist, 2nd Ann. Ohio Collaborative Conference in Bioinformatics, Oxford, Ohio, 2007.
- Selection Panel, Chinese National Science Foundation, 2001
- Glennan Fellowship, University Center for Instruction and Teaching Excellence, CWRU, 2001-2002

### **Funding**

- Phenotyping of Mice Using Bioimaging, NIH, PI G.-Q. Zhang, 2005-2009.
- CTSC, NIH, PI Pamela Davis, 2007-2012.
- Choose Ohio First Scholarship Award, PI Lonnie Welch, Sub-contract PI G.-Q. Zhang, 2008-2013.
- A Web-Based Airborne Remote Sensing Telemetry Server, Sub-contract PI G.-Q. Zhang, NASA, 2005-2006.
- A Web-Interfaced Mouse MR Imaging Repository, PI G.-Q. Zhang, Ohio Board of Regents, 2004-2005.
- Cluster-Ohio, PI Austin Melton, Equipment funding, 2002-2003.
- Imperfect Information Flow: Modeling Channels and Defaults in Domain Theory, PI W. Rounds, NSF, 1996-1999.

### **Supervision**

**Current Students** (as Major Advisor): Remo Mueller (Ph.D.), Catherine Jayapandian (Ph.D.), Van Anh Tran (Ph.D.), Nathan Johnson (Ph.D.), Fangping Huang (Ph.D.), Guangyu Chen (M.Sc.), Bret Kiraly (M.Sc.), Remington Davenport (M.Sc.).

**Recently Completed Ph.D. Dissertations** (as Major Advisor): Jacek Szymanski (Ph.D.), Adam Troy (Ph.D.), Ye Tian (Ph.D.), Gongqin Shen (Ph.D.) Remo Mueller (M.Sc.), Keith Bourgojn (M.Sc.), Frank Duncan (M.Sc.), Markus Krötzsch (M.Sc.).