

Curriculum Vitae of Gregory Butler

Personal Data

Name Gregory Butler.

Birth March 19, 1953, Sydney, Australia.

Citizenship Australian. Permanent resident of Canada since November 1991.

Status Married, no children.

Home Address

4622 Bouchette
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Ph: (514) 738 4272

Work Address

Department of Computer Science, Concordia University
1455 de Maisonneuve Blvd, West
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URL: <http://www.cs.concordia.ca/~faculty/gregb>

Languages English, German, some French.

Education

Ph.D. Pure Mathematics, University of Sydney, 1980
B.Sc.(First Class Honours) Pure Mathematics, University of Sydney, 1976

Employment

1992- Computer Science, Concordia University, Montreal, Canada
Professor (1999-present)
Associate Professor (1992-99) — tenure in 1995
Limited-Term Associate Professor (January-May 1992)
1981-90 Computer Science, University of Sydney, Sydney, Australia
Senior Lecturer (1987-90)
Lecturer (1981-87) — tenure in 1983
1980/81 Postdoctoral Fellow
Computer Science, Concordia University
1979/80 Postdoctoral Fellow
jointly in Department of Mathematics, McGill University and
Department of Computer Science, Concordia University

Visiting Positions

1999	Visiting Scientist, European Media Lab, Heidelberg, Germany
1999	Visitor, Multimedia Database Systems Group, RMIT, Melbourne, Australia
1998	Visiting Professor, Institut für Algorithmen und Kognitive Systeme, Universität Karlsruhe, Germany
1991	Visiting Scientist, Computer Science, Concordia University
1990	Visiting Professor, Lehrstuhl II für Mathematik (Informatik), Universität Bayreuth, Germany
1985	Visiting Scholar, Computer and Information Sciences, University of Delaware, USA

Consulting

August 2000: HiCom Data Systems, Montreal. Guidance on extensibility in software architectures.

June–August 1999: European Media Lab, Heidelberg. Consulting on database technology for simulation of biochemical pathways.

June–August 1997, February–May 1998: Revenue Canada. Technical audit of R&D claim for object-oriented technology.

February 1995: Famic-Talis, Inc, Montreal. Consulting on object-oriented design and design patterns.

Grants — Canadian

2001–2004	NSERC Genomics Project Grant	\$570,000
2000–2004	NSERC Operating Grant	\$28,298 p.a.
1999–2003	CFI Institutional Innovation Fund (Tsang et al)	\$1,246,080
1999–2003	MEQ Institutional Innovation Fund (Tsang et al)	\$1,246,080
1999	FCAR Centre Grant (Darmon et al)	\$50,000
1997–99	FRDP Major Interdisciplinary (Tsang et al)	\$45,000 p.a.
1996–2000	NSERC Operating Grant	\$24,500 p.a.
1996–99	FCAR Centre Grant (Murty et al)	\$80,000 p.a.
1996–98	SEAGRAM Innovative Research (Grogono, Butler)	\$15,000 p.a.
1995	NSERC Equipment Grant (Lam, Butler)	\$60,000
1994–97	FCAR Team Grant (Lam et al)	\$45,600 p.a.
1994	NSERC Equipment Grant (Cummins et al)	\$30,926
1993–96	FCAR Centre Grant (Kisilevsky et al)	\$70,000 p.a.
1993–96	NSERC Infrastructure Grant (Lam et al)	\$17,000 p.a.
1993–96	NSERC Operating Grant	\$22,000 p.a.
1992	NSERC Equipment Grant	\$17,350
1992–95	FRDP Start-up Operating Grant	\$13,000 p.a.
1992	FRDP Equipment Grant	\$ 5,000
Total		\$4,599,428

Grants — Australian

1986–91	ARC Project Grant (Cannon, Butler) <i>Language and knowledge based systems for modern algebra</i>	\$156,355
1982–91	ARC Project Grant (Wall, Cannon, Butler) <i>Algebraic algorithms and their applications</i>	\$232,833
1990	U. Sydney Equipment Grant (Cannon et al)	\$46,000
1988	U. Sydney Equipment Grant (Comp.Sci.)	\$112,000
1987	U. Sydney Equipment Grant (Cannon et al)	\$58,000
Total		\$605,188

Publications

Life-time summary:

- 2 book
- 1 thesis
- 2 chapter in book
- 20 papers in refereed journals
- 36 papers in refereed conference proceedings
- 23 technical reports (not shown)
- 19 other

Publications in Reverse Chronological Order

Greg Butler, Ling Chen, Xuede Chen, Ashraf Gaffar, Jinmiao Li, Lugang Xu, *The Know-It-All Project: A Case Study in Framework Development and Evolution*, to appear in **Domain Oriented Systems Development: Perspectives and Practices**, Kiyoshi Itoh, Satoshi Kumagai (eds), Gordon Breach Science Publishers, UK, 2002

Greg Butler, Andrea Gantchev, Peter Grogono, *Object-Oriented Design of the Subsumption Architecture*, to appear in *Software — Practice and Experience*.

Greg Butler, Lugang Xu, *Cascaded Refactoring for Framework Evolution*, Proceedings of 2001 Symposium on Software Reusability, (May 10-11, 2001, Toronto), ACM Press, 2001, pp. 51–57.

Greg Butler, Stan Jarzabek (editors), **Generative and Component-Based Software Engineering**, (Proceedings of a conference at Erfurt, October 9-12, 2000), Lecture Notes in Computer Scienc 2177, Springer, 2001.

Greg Butler, Ling Chen, Xuede Chen, Lugang Xu, *Diagrammatic Queries and Graph Databases* (Extended Abstract), Workshop on Managing and Integrating Biochemical Data, European Media Lab, September 25–26, 2000.

Greg Butler, Erich Bornberg-Bauer, Gosta Grahne, Franz Kurfess, Clement Lam, Joey Paquet, Isabel Rojas, Rajjan Shinghal, Lixin Tao, Adrian Tsang. *The BioIT Projects: Internet, Database and Software Technology Applied to Bioinformatics*, SSGRR'2000, International conference on advances in infrastructure for electronic business, science and education on the internet, July 31 – August 5, 2000, Scuola Superiore G. Reiss Romoli SpA, Coppoto, Italy. URL <http://www.ssgrr.it/en/ssgrr2000/proceedings.htm> ISBN 88-85280-52-8

Shawn Delaney, Greg Butler, Clement Lam, Larry Thiel, *Three Improvements to the BLASTP Search of Genome Databases*, **Proceedings of the 12th International Conference on Scientific and Statistical Database Management**, (Berlin, July 26-28, 2000), Oliver Günther and Hans-J. Lenz (eds), IEEE Computer Society, Los Alamitos, CA, 2000, pp. 14–24.

G. Butler, R.K. Keller, H. Mili, *A framework for framework documentation*, ACM Computing Surveys 32,1 (March 2000) electronic symposium.

Greg Butler, Andrea Gantchev, Peter Grogono, *Reusable strategies for software agents via the subsumption architecture*, **Proceedings of Asia-Pacific Software Engineering Conference**, (Takamatsu, Japan, 7–10 December, 1999), IEEE Computer Society Press, Los Alamitos, CA, 1999, pp. 326–333.

G. Butler, *Database technology for pathways*, In *Workshop on Computation of Biochemical Pathways and Genetic Networks*, E. Bornberg-Bauer, A. de Beuckelaer, U. Kummer, U. Rost (eds), Logos Verlag, Berlin, 1999, ISBN 3-89722-093-8, pp. 89-95.

M.M. Abdalla, F. Khendek, G. Butler, *New results on deriving SDL specifications from MSCs*, **Proceedings of the SDL Forum '99**, R. Dssouli, G.v. Bochmann and Y. Lahav (eds.), Elsevier Science B. V., 1999, pp. 51–66.

G. Butler, T. Kharma, I.A. Tjandra, *Towards OM — An object-oriented implementation of Mantra*. **Database Systems 99**, (Proceedings of the 10th Australasian Database Conference, ADC'99, Auckland, NZ, 18-21 January 1999), John Roddick (editor), Australian Computer Science Communications vol. 21, no. 2, pp. 89–100, Springer-Verlag, Singapore, 1999.

S. Li and G. Butler, *Reengineering a B-tree implementation using design patterns*, **Computer Science 99**, (Proceedings of the 22nd Australasian Computer Science Conference, ACSC '99, Auckland, NZ, 18-21 January 1999), Jenny Edwards (editor), Australian Computer Science Communications vol. 21, no. 1, pp. 384–395, Springer-Verlag, Singapore, 1999.

G. Butler, *Developing Frameworks by Aligning Requirements, Design, and Code*, **Proceedings of 9th Workshop on Software Reuse (WISR-9)**, Austin, Texas, January 1999, 5 pages.

G. Butler, P. Grogono and F. Khendek, *A reuse case perspective on documenting frameworks*, Proceedings of Asia-Pacific Software Engineering Conference (December 2-4, 1998, Taiwan), IEEE Computer Society Press, Los Alamitos, CA, 1998, pp. 94–101.

Y. Peng, F. Khendek, P. Grogono, G. Butler, *Feature interactions detection technique based on feature assumptions*, **Feature Interactions in Telecommunications and Software Systems**, K. Kimbler and L.G. Bouma (eds), IOS Press, Amsterdam, 1998, pp. 291–298.

F. Khendek, G. Robert, G. Butler, P. Grogono, *Implementability of Message Sequence Charts*, in International Workshop of SDL Forum Society on SDL and MSCs, 1998, pages 71–80.

G. Butler, *Documenting-in good design*, August 1997, 3 pages. Position paper for OOPSLA'97 Workshop #12: Object-Oriented Design Quality.

G. Butler, *Clarifying use cases*, August 1997, 3 pages. Position paper for OOPSLA'97 Workshop #24: Requirements Engineering: Use Cases and More.

G. Butler and P. Dénoimée, *Documenting frameworks*, in **Building Application Frameworks: Object-Oriented Foundations of Framework Design**, M. Fayad, D. Schmidt, R. Johnson (eds), John Wiley and Sons, New York, September 1999, pp.495–504.

G. Butler, P.D. Grogono and F. Khendek, *A Z specification of use cases: A preliminary report*, Proceedings of Asia-Pacific Software Engineering Conference and International Computer Science Conference (December 2-5, 1997, Hong Kong), IEEE Computer Society Press, Los Alamitos, CA, 1997, pages 505–506.

G. Butler, *Quality and reuse in industrial software engineering*, Proceedings of Asia-Pacific Software Engineering Conference and International Computer Science Conference (December 2-5, 1997, Hong Kong), IEEE Computer Society Press, Los Alamitos, CA, 1997, pages 3–12.

G. Butler and P. Dénoimée, *Documenting frameworks*, **Proceedings of 8th Workshop on Software Reuse (WISR-8)**, Columbus, Ohio, March 1997, 5 pages.

G. Butler, *Software architecture for computer algebra: A case study*, **Design and Implementation of Symbolic Computation Systems**, J. Calmet and C. Limongelli (eds), Lecture Notes in Computer Science 1128, Springer-Verlag, Berlin, 1996, pages 277–286.

G. Butler, P. Grogono, R. Shinghal, I.A. Tjandra, *Document recognition, semantics, and symbolic reasoning in reverse engineering of software*, **Artificial Intelligence and Symbolic Mathematical Computing**, J. Calmet, J.A. Campbell and J. Pfalzgraf (eds), Lecture Notes in Computer Science 1138, Springer-Verlag, Berlin, 1996, pages 38–48.

G. Butler, P. Dénomée and I.A. Tjandra, *Documenting frameworks*, October 1995, 5 pages. Position paper for OOPSLA'95 workshop #27: Framework-Centered Software Development.

G. Butler, P. Grogono, R. Shinghal, I.A. Tjandra, *Analyzing the logical structure of data flow diagrams in software documents*, **Proceedings of the Third International Conference on Document Analysis and Understanding**, Montreal, August 14–16, 1995, IEEE Press, pp. 575–578.

G. Butler, P. Grogono, R. Shinghal, I.A. Tjandra, *Retrieving information from data flow diagrams*, **Proceedings of Second Working Conference on Reverse Engineering**, L. Wills, P. Newcomb, E. Chikofsky (eds), IEEE Computer Society Press, Los Alamitos, CA, 1995, pages 22–29.

I.A. Tjandra and G. Butler, *Formal representation of reusable software modules*, **Proceedings of Second Working Conference on Reverse Engineering**, L. Wills, P. Newcomb, E. Chikofsky (eds), IEEE Computer Society Press, Los Alamitos, CA, 1995, pages 198–205.

G. Butler, *Intelligent mathematical databases*, **Database Systems for Advanced Applications '95**, (Proceedings of the Fourth International Conference on Database Systems for Advanced Applications, Singapore, April 10–13, 1995), T.W. Ling and Y. Masunaga (eds), World Scientific Press, Singapore, 1995, pp.326–332.

G. Butler, *Easy verification of behavioural subtyping in common cases*, *Information Processing Letters* **55** (1995) 57–58.

F. Ng, G. Butler and J. Kay, *An intelligent tutoring system for the Dijkstra-Gries methodology*, *IEEE Transactions on Software Engineering* **21**, 5 (May 1995) 415–428.

G. Butler and S. S. Iyer, *An experimental knowledge base of simple groups*, *Australian Journal of Intelligent Information Processing Systems* **2**, 1 (1995) 11–23.

G. Butler and C.W.H. Lam, *The preliminary design of an object-oriented framework for combinatorial enumeration*, **Object-Oriented Technology for Database and Software Systems**, V.S. Alagar and R. Missaoui (eds), World Scientific Publishing, 1995, pp. 134–144.

G. Butler, *Datalog and TwoGroups and C++*, **Integrating Symbolic Mathematical Computation and Artificial Intelligence**, Jacques Calmet and John A. Campbell (eds), *Lecture Notes in Computer Science* **958**, Springer-Verlag, Berlin, 1995, pp. 80–92.

G. Butler, *Design deltas in reusable object-oriented design*, **Proceedings of 7th Workshop on Software Reuse (WISR-7)**, St Charles, Illinois, August 26–30, 1995, 6 pages.

G. Butler, *Computing the conjugacy classes of elements of a finite group*, **Groups'93 Galway/St Andrews**. C.M. Campbell, T.C. Hurley, E.F. Robertson, S.J. Tobin, J.J. Ward (eds), CUP, Cambridge, 1995, 80–112.

G. Butler, S.S. Iyer, and E.A. O'Brien, *A database of groups of prime-power order*, *Software — Practice and Experience* **24**, 10 (October 1994) 911–951.

G. Butler, *An inductive schema for computing conjugacy classes in permutation groups*, *Math. Comp.* **62**, 205 (January 1994) 363–383.

F. Ng and G. Butler, *Specialized theorem-proving in an intelligent tutoring system for the Dijkstra-Gries programming methodology*, **Proceedings ICCI'93**, O. Abou-Rabia, C.K. Chang, W.W. Koczkodaj (editors), IEEE Computer Society Press, Los Alamitos, CA, 1993, pp. 294–298.

G. Butler, *The progress towards an intelligent assistant — a discussion paper*, **Artificial Intelligence and Symbolic Mathematical Computing**, J. Calmet and J.A. Campbell (eds), *Lecture Notes in Computer Science* **737**, Springer-Verlag, Berlin, 1993, pp. 107–115.

G. Butler, *The transitive groups of degree fourteen and fifteen*, *J. Symb. Comp.* **16**, 5 (November 1993) 413–422.

- G. Butler, *Reusable reliable software components for computer algebra*, **Proceedings of 6th Workshop on Software Reuse (WISR-6)**, Owego, November 2–4, 1993, 5 pages.
- G. Butler, S.S. Iyer, E.A. O'Brien, *TwoGroups: a database for group-theory*, *Notices of the AMS* **40**, 7 (September 1993) 839–841.
- P. Grogono, G. Butler, M. Okada, **Programming Methodology: Course Notes for COMP 245**, Dept of Computer Science, Concordia University, July 31, 1993, (iv)+170 pages.
- G. Butler and C.W.H. Lam, *Proof obligations in a framework for combinatorial enumeration*, July 9, 1993, 4 pages. Position paper for OOPSLA'93 workshop #5 : Specification of Behavioral Semantics in OO Information Modeling.
- G. Butler and J.J. Cannon, *On Holt's algorithm*, *J. Symb. Comp.* **15**, 2 (February 1993) 229–233.
- G. Butler, S.S. Iyer, E.A. O'Brien, *A User Guide to TwoGroups*, January 4, 1993, 8 pages.
- G. Butler, *Experimental comparison of algorithms for Sylow subgroups*, **ISSAC 92**, Paul S. Wang (ed.), ACM Press, New York, 1992, pp.251–262.
- G. Butler, *An analysis of Atkinson's algorithm*, *SIGSAM Bulletin* **26**, 2 (April 1992) 1–9.
- G. Butler and S.S. Iyer, *Towards a deductive database for small simple groups*, *SIGSAM Bulletin* **25**, 4 (October 1991) 7–17.
- G. Butler and J.J. Cannon, *Computing Sylow subgroups of permutation groups using homomorphic images of centralizers*, *J. Symb. Comp.* **12** (1991) 443–457.
- G. Butler, **Fundamental Algorithms for Permutation Groups**, *Lecture Notes in Computer Science* **559**, Springer-Verlag, Heidelberg, 1991, (xii)+238 pages. (research monograph)
- G. Butler, *Implementing some algorithms of Kantor*, **AAECC-9**, H.F. Mattson, T. Mora, T.R.N. Rao (eds), Springer LNCS **539**, 1991, pp. 82–93.
- G. Butler, S.S. Iyer, and S.H. Ley, *A deductive database for the groups of order dividing 128*, **ISSAC 91**, S.M. Watt (ed.), ACM Press, New York, 1991, pp. 210–218.
- G. Butler and J.J. Cannon, *The design of Cayley — a language for modern algebra*, in **Design and Implementation of Symbolic Computation Systems**, A. Miola (ed.), Springer LNCS **429**, 1990, pp. 10–19.
- G. Butler and S.S. Iyer, *Deductive mathematical databases — a case study*, **Statistical and Scientific Database Management**, Z. Michalewicz (ed.), Springer LNCS **420**, 1990, pp. 50–64.
- G. Butler and J.J. Cannon, *Cayley, version 4: the user language*, in **Symbolic and Algebraic Computation**, P. Gianni (ed.), Springer LNCS **358**, 1989, pp. 456–466.
- G. Butler and J.J. Cannon, *Computing in permutation and matrix groups III : Sylow subgroups*, *J. Symb. Comp.* **8**, 3 (1989) 241–252.
- G. Butler, *A proof of Holt's algorithm*, *J. Symb. Comp.* **5** (1988) 275–283.
- G. Butler, *Permutation groups and p-groups*, in **Computers in Algebra**, M.C. Tangora (ed.), Marcel Dekker, New York, 1988, pp. 1–16.
- G. Butler and M.J. Kendall, *The suitability for master/slave concurrency of Concurrent Euclid, Ada, and Modula*, *Software — Practice and Experience* **17**, 2 (1987) 117–134.
- G. Butler, *The coercion problem in Cayley*, *Cayley Bulletin* **3** (October 1987) 104–105.

- G. Butler, *Divide-and-conquer in computational group theory*, SYMSAC '86, B.W. Char (ed.), ACM, New York, 1986, 59–64.
- G. Butler, *Data structures and algorithms for cyclically extended Schreier vectors*, Congressus Numerantium **52** (May 1986) 63–78.
- G. Butler and C.W.H. Lam, *A general backtrack algorithm for the isomorphism problem of combinatorial objects*, J. Symb. Comp. **1**, 4 (1985) 363–381.
- G. Butler, *Effective computation with group homomorphisms*, J. Symb. Comp. **1**, 2 (1985) 143–157.
- G. Butler, *An improvement to the centralizer algorithm for permutation groups*, SIGSAM Bulletin **19**, 2 (May 1985) 14–18.
- G. Butler, *On computing double coset representatives in permutation groups*, **Computational Group Theory**, M.D. Atkinson (ed.), Academic Press, London, 1984, 283–290.
- G. Butler and J. McKay, *The transitive groups of degree up to eleven*, Comm. of Algebra **11**, 8 (1983) 863–911.
- G. Butler, *Computing normalizers in permutation groups*, J. Algorithms **4** (1983) 163–175.
- G. Butler, *Computing in permutation and matrix groups II : backtrack algorithm*, Math. Comp. **39**, 160 (1982) 671–680.
- G. Butler and J.J. Cannon, *Computing in permutation and matrix groups I : normal closure, commutator subgroup, series*, Math. Comp. **39**, 160 (1982) 663–670.
- G. Butler, *The maximal subgroups of the Chevalley group $G_2(4)$* , **Groups - St Andrews 1981**, C.M. Campbell and E.F. Robertson (eds), CUP, Cambridge, 1982, 186–200.
- G. Butler, *Double cosets and searching small groups*, SYMSAC '81, P. Wang (ed.), ACM, New York, 1981, 182–187.
- G. Butler, *The maximal subgroups of the sporadic simple group of Held*, J. Algebra **69**, 1 (1981) 67–81.
- G. Butler, *Computational approaches to certain problems in the theory of finite groups*, Bulletin of the Australian Math. Soc. **22**, 3 (1980) 467–468. (abstract of thesis)
- G. Butler, *The maximal subgroups of the Chevalley group $G_2(4)$* , Abstracts AMS **1**, 4 (1980) 369. (abstract)
- G. Butler, **Computational Approaches to Certain Problems in the Theory of Finite Groups**, Ph.D. Thesis, University of Sydney, 1979, 306 pages, 2 microfiche supplements.
- G. Butler, *Maximal subgroups of the sporadic simple group of Held*, Notices AMS **25**, 7 (1978) A-695. (abstract)
- G. Butler, *The Schreier algorithm for matrix groups*, SYMSAC '76, R.D. Jenks (ed.), ACM, New York, 1976, 167–170.

Talks, Seminars, Conferences and Workshops

2001-06-19: Co-organizer, workshop #12, *Generative Programming*, European Conference on Object-Oriented Programming, Budapest.

2001-06-18: *Object-oriented frameworks*, tutorial #8, European Conference on Object-Oriented Programming, Budapest.

2001-05-19: *Cascaded refactoring for framework evolution*, paper, Symposium on Software Reusability, Toronto.

2001-05-14: Co-organizer, workshop #7, *Generative Techniques in Product Lines*, International Conference on Software Engineering, Toronto.

2000-12-19: *Innovative Databases for Bioinformatics*, Dept of Computer Science and Software Engineering, University of Western Australia.

2000-12-14: *The Know-It-All Project: Framework Development meets Database Management Systems*, School of Information Technology, Murdoch University.

2000-12-12: *Object-oriented application frameworks*, Dept of Computer Science and Software Engineering, University of Western Australia.

2000-12-05 to 08: Asia-Pacific Software Engineering Conference, School of Computing, National University of Singapore.

2000-12-05: *Use Cases, Operational Profiles, Scenarios, Architecture, and Refactoring*, Workshop on Two-Stage Derivation of Systems Architectures, Singapore.

2000-11-12: *Advanced database technology for genomics*, The First Canadian Working Conference on Computational Biology, Toronto, November 12, 2000.

2000-10-11 and 12: Session chair, Conference on Generative and Component-Based Software Engineering, Erfurt, October 9-12, 2000.

2000-09-26: *Diagrammatic queries and graph databases*, Workshop on Managing and Integrating Biochemical Data, European Media Lab, September 25-26, 2000.

2000-08-31: *Report of the Workshop on Generative Techniques in Product Lines*, Panel at First Software Product Line Conference, Denver, August 28-31, 2000.

2000-08-04: *The BioIT Projects: Internet, Database and Software Technology Applied to Bioinformatics*, SSGRR'2000, International conference on advances in infrastructure for electronic business, science and education on the internet Scuola Superiore G. Reiss Romoli SpA, Coppoto, Italy.

2000-07-26: *Three improvements to the BLASTP search of genome databases*, Statistical and Scientific Database Management conference, Berlin.

2000-06-19: *BLAST! How do you search sequence databases*, tutorial by Butler, Grahne, Lam at CRM Combinatorial Pattern matching Summer School, Montreal.

2000-05-17: *The Know-It-All Project: Providing Advanced Database Technology for Genomics*, ACFAS Bioinformatics symposium, Montreal.

1999-12-14 to 15: Workshop on Genome Informatics (GIW'99), Tokyo, Japan.

1999-12-09: *Reusable strategies for software agents via the subsumption architecture*, Asia Pacific Software Engineering Conference, Takamatso City, Japan.

1999-12-07: *The Know-It-All Project: Framework Development Meets DBMS*, Workshop on Domain Oriented Systems Development, APSEC'99, Takamatso City, Japan.

1999-11-01: Workshop on Object Technology and Product Lines, OOPSLA'99, Denver.

1999-11-01 to 05: Conference on Object-Oriented Programming, Systems, Languages, and Applications, Denver.

1999-08-13: *Database technology for pathways*, Workshop on Computation of Biochemical Pathways and Genetic Networks, Heidelberg.

1999-08-06 to 10: Seventh International Conference on Intelligent Systems for Molecular Biology, Heidelberg.

1999-06-17: *Framework development and evolution*, Panel session on Systematic Reuse and Object Technology, ECOOP'99, Lisbon, Portugal.

1999-04-23: *Object-oriented Application Frameworks*, School of Computer Science, University of Windsor.

1999-04-22: *Basics of Software Design: Seeing the Big Picture — One Slice at a Time*, School of Computer Science, University of Windsor.

1999-03-31: *Object-oriented Application Frameworks*, School of Computing Sciences, University of Technology, Sydney.

1999-03-23: *Object-oriented Application Frameworks*, School of Computer Science, University of New South Wales.

1999-03-09: *Object-oriented Application Frameworks*, Department of Computer Science and Software Engineering, University of Melbourne.

1999-03-04: *Innovative Databases for Bioinformatics*, Multimedia Database Systems Group, RMIT, Melbourne.

1999-02-12: *The Know-It-All Project: Framework Development Meets DBMS*, Department of Computer Science, RMIT, Melbourne.

1999-01-21: Session chair, Australasian Computer Science Conference, Auckland, New Zealand.

1999-01-20: *Reengineering a B-tree implementation using design patterns*, Australasian Computer Science Conference, Auckland, New Zealand.

1999-01-18: *Towards OM — An object-oriented implementation of Mantra*, Australasian Database Conference, Auckland, New Zealand.

1999-01-07 to 09: *Developing Frameworks by Aligning Requirements, Design, and Code*, WISR'9 (Workshop on Institutionalizing Software Reuse), University of Texas, Austin, Texas.

1998-10-07 to 10: GCB'98, German Conference on Bioinformatics, Köln.

1998-09-16: Talking Proteins: EMBO Workshop on Sequence Analysis, Modelling and Simulation, European Molecular Biology Laboratory, Heidelberg.

1998-09-29 to 10-1: Fifth International Workshop on Feature Interactions in Telecommunications and Software Systems, Lund, Sweden.

1998-09-29: *Databases, Knowledgebases, Frameworks and Bioinformatics*, Astra Draco Bioinformatics, Lund, Sweden.

1998-06-28 to 07-01: Sixth International Conference on Intelligent Systems for Molecular Biology, Montreal.

- 1998-05-08: *Object-oriented Application Frameworks*, Parke-Davis Research, Ann Arbor, Michigan.
- 1998-03-26 to 27: Second International Symposium on Fungal Genomics, Athens, GA.
- 1997-12-11: *Object-oriented Application Frameworks*, Dept Information Science and Computer Science, National University of Singapore.
- 1997-12-09: *A multi-level nearest-neighbour algorithm for predicting protein secondary structure*, Bioinformatics Research Unit, Institute for Systems Science, National University of Singapore.
- 1997-12-03: *Quality and reuse in industrial software engineering*, Joint APSEC'97 & ICSC'97 Conference, Hong Kong.
- 1997-10-06: Workshop #24: Requirements Engineering: Use Cases and More, OOPSLA'97, Atlanta, GA.
- 1997-10-05: Workshop #12: Object-Oriented Design Quality, OOPSLA'97, Atlanta, GA.
- 1997-07-05: *Requirements engineering*,
- 1997-07-05: *UML — activity diagrams*, talk, Object-oriented Design Forum, Concordia University.
- 1997-06-21: *UML — collaboration diagrams*, talk, Object-oriented Design Forum, Concordia University.
- 1997-05-24: *UML — sequence diagrams*, talk, Object-oriented Design Forum, Concordia University.
- 1997-05-20 to 23: International Conference on Software Engineering, Boston.
- 1997-05-17 to 19: Symposium on Software Reusability, Boston.
- 1997-05-10: *UML — use cases*, talk, Object-oriented Design Forum, Concordia University.
- 1997-03-24: *Documenting frameworks*, presentation, 8th Workshop on Software Reuse, Columbus, Ohio.
- 1996-12-06: *Machine learning & Predicting secondary structure of proteins*, Bioinformatics Seminar, Concordia University.
- 1996-10-19: *Overview of Unified Modelling Language (UML)*, talk, Object-oriented Design Forum, Concordia University.
- 1996-09-23: Panel on *Engineering and industrial applications*, Third International Conference on Artificial Intelligence and Symbolic Mathematical Computation, Steyr, Austria.
- 1996-09-23: *Document recognition, semantics, and symbolic reasoning in reverse engineering of software*, presentation, Third International Conference on Artificial Intelligence and Symbolic Mathematical Computation, Steyr, Austria.
- 1996-09-20: Session Chair, International Symposium on Design and Implementation of Symbolic Computation Systems, Karlsruhe.
- 1996-09-20: *Software architecture for computer algebra: A case study*, presentation, International Symposium on Design and Implementation of Symbolic Computation Systems, Karlsruhe.
- 1996-09-07: *Software architectures*, talk, Object-oriented Design Forum, Concordia University.
- 1996-05-15: Session Chair, Second International Magma Conference, Marquette University, Milwaukee
- 1996-03-15: *The Mantra user interface built using ET++*, talk, Object-oriented Design Forum, Concordia University.
- 1996-02-10: *Event handling in ET++*, talk, Object-oriented Design Forum, Concordia University.
- 1996-02-06: *An entree to Entrez*, Bioinformatics Seminar, Concordia University.

- 1995-11-25: *ET++ framework*, talk, Object-oriented Design Forum, Concordia University.
- 1995-10-21: *Report on OOPSLA'95*, talk, Object-oriented Design Forum, Concordia University.
- 1995-10-16: Workshop #27: Framework-Centered Software Development, OOPSLA'95, Austin, TX.
- 1995-08-27: *Design deltas in reusable object-oriented design*, presentation, 7th Workshop on Software Reuse, St Charles, Illinois.
- 1995-08-22: *An introduction to genome databases*, Bioinformatics Seminar, Concordia University.
- 1995-07-15: *An ET++ interface for the Bouncing Ball Game*, talk, Object-oriented Design Forum, Concordia University.
- 1995-07-14: *Groups in Combinatorial Searching*, presentation, Magma Workshop, Concordia University.
- 1995-07-12 to 14: Organizing Committee: Magma Workshop at ISSAC'95, Concordia University, Montreal.
- 1995-07-10 to 12: Registration Chair and member of Organizing committee: International Symposium on Symbolic and Algebraic Computation, Concordia University, Montreal.
- 1995-06-17: *Design patterns in the Bouncing Ball Game*, talk, Object-oriented Design Forum, Concordia University.
- 1995-06-13: *Introduction to C++: The Bouncing Ball Game — Motif interface*, talk, C++ Forum, Concordia University.
- 1995-05-16: *Introduction to C++: The Bouncing Ball Game — RubberBall subclass*, talk, C++ Forum, Concordia University.
- 1995-04-27: *Trends in industrial software engineering: quality, reuse, modeling*, presentation, International Workshop on Restructuring Strategies for Electronics and Information Industry - Advances in Technology, Emerging Markets and Investment Opportunities, Asian Institute of Technology, Thailand.
- 1995-04-13: *Intelligent mathematical databases*, presentation, 4th International Conference on Database Systems for Advanced Applications, Singapore.
- 1995-04-03: *Intelligent mathematical databases*, CICMA Discrete Mathematics Seminar, Concordia University.
- 1995-03-21: *Introduction to C++: The Bouncing Ball Game — Basic classes*, talk, C++ Forum, Concordia University.
- 1995-02-28: *Introduction to C++ — Linked list template*, talk, C++ Forum, Concordia University.
- 1995-01-17: *Introduction to C++ — Simple I/O, simple examples*, talk, C++ Forum, Concordia University.
- 1994-11-21: *An introduction to Magma*, CICMA Discrete Mathematics Seminar, Concordia University.
- 1994-10-17: *Computing conjugacy classes of elements*, CICMA Discrete Mathematics Seminar, Concordia University.
- 1994-10-03: *Reusable Object-Oriented Design*, seminar, Computer Science, Concordia University.
- 1994-09-26: *On the isotopy group of reduced latin squares*, CICMA Discrete Mathematics Seminar, Concordia University.
- 1994-08-22: *Reusable Object-Oriented Design*, seminar, Computer Science, University of Queensland.
- 1994-08-19: *Reusable Object-Oriented Design*, seminar, Computer Science, James Cook University, Townsville.

1994-08-16: *Reusable Object-Oriented Design*, seminar, Computer Science, University of Wollongong.

1994-08-12: *Reusable Object-Oriented Design*, seminar, Computer Science, University of Sydney.

1994-08-05: Panel on *Grand Challenges for AI and SMC*, Second International Conference on Artificial Intelligence and Symbolic Mathematical Computing, Cambridge, UK.

1994-08-03: *Datalog and TwoGroups and C++*, presentation, Second International Conference on Artificial Intelligence and Symbolic Mathematical Computing, Cambridge, UK.

1994-07-28: *Datalog and TwoGroups and C++*, seminar, Computing Science Department, Glasgow University.

1994-06-19 to 23: Program Committee member and Session chair, International Symposium on Symbolic and Algebraic Computation, St Catherine's College, Oxford.

1994-05-16: *The preliminary design of an object-oriented framework for combinatorial enumeration*, presentation, Colloquium on Object Orientation in Databases and Software Engineering, Montreal.

1994-03-24: *Reusable Object-Oriented Design*, seminar, Computer Science, University of Ottawa.

1994-03-09: *Object-oriented framework for combinatorial enumeration*, CICMA Discrete Mathematics Seminar, Concordia University.

1994-01-26: *Counting maximal self-dual codes*, CICMA Discrete Mathematics Seminar, Concordia University.

1993-11-02: *Reusable reliable software components for computer algebra*, presentation at 6th Annual Workshop on Software Reuse, Owego, NY.

1993-09-26: Workshop #5: Specification of Behavioral Semantics in OO Information Modeling, OOPSLA '93, Washington, DC.

1993-08-26: *Progress on the hard problems in permutation groups*, invited talk, Cayley/Magma Conference, London.

1993-08-06: *Computing the conjugacy classes of elements of a finite group*, presentation, Groups'93-Galway/St Andrews, Galway.

1993-07-05: *Enumerating regular subgroups*, CICMA Discrete Mathematics Seminar, Concordia University.

1993-06-07: *On automorphisms of V_q^n , the football pool graph*, CICMA Discrete Mathematics Seminar, Concordia University.

1993-05-27: *Specialized theorem-proving in an intelligent tutoring system for the Dijkstra-Gries programming methodology*, presentation, International Conference on Computers and Information, Sudbury, Ontario.

1993-01-18: *Permutation group algorithms based on partitions*, CICMA Discrete Mathematics Seminar, Concordia University.

1992-11-12: *Orbit graphs for the dominating set problem*, CICMA Discrete Mathematics Seminar, Concordia University.

1992-08-03: Panel on *What is the interaction between AI and SMC?*, International Conference on Artificial Intelligence and Symbolic Mathematical Computing, Karlsruhe.

1992-08-03: *The progress towards an intelligent assistant — a discussion paper*, presentation, International Conference on Artificial Intelligence and Symbolic Mathematical Computing, Karlsruhe.

1992-07-28: *Experimental comparison of algorithms for Sylow subgroups*, presentation, International Symposium on Symbolic and Algebraic Computation, Berkeley.

1992-06-09: *Applications of homomorphisms*, invited talk, Workshop on Computational Group Theory, Oberwolfach.

1992-06-05: *Cayley: Objects and databases*, seminar, Universität Karlsruhe.

1992-03-09: *Computing sylow subgroups: Completion, symmetry, homomorphisms, and hybrids*, seminar, Computer Science, Concordia University.

1991-12-13: *Cayley: Objects and databases*, presentation, Montreal Workshop on Programming Language Theory, Montreal.

1991-10-11: *Implementing some algorithms of Kantor*, presentation, AAECC, New Orleans.

1991-10-10: Panel on *Implementation state-of-the-art*, DIMACS Workshop on Groups and Computation, Rutgers, NJ.

1991-04-??: *Computing sylow subgroups of permutation groups*, seminar, University of Bath, UK.

1991-03-??: *Computing sylow subgroups of permutation groups*, seminar, University of Warwick, UK.

1991-03-??: *Computing sylow subgroups of permutation groups*, seminar, University of Birmingham, UK.

1991-03-11: Invited participation, DIMACS Workshop on Symbolic Software for Mathematics Research, Rutgers, NJ.

1990-11-??: *Computing sylow p -subgroups of permutation groups*, invited presentation, Conference on Computational Algebra and Number Theory in Honour of G.E. Wall, University of Sydney.

1990-09-26: *Computer algebra as a testbed for software systems research*, seminar, Computer Science, Concordia University, Montreal.

1990-09-20: *Computer algebra as a testbed for software systems research*, seminar, Computer Science, University of Sydney.

1990-07-03: *Cayley: Objects and databases*, tutorial, Summer School, RISC, Linz.

1990-06-20: *Varieties in algebraic computation*, seminar, Universität Bayreuth.

1990-05-31: *Cayley: Objects and databases*, seminar, Universität Bayreuth.

1990-04-10: *The design of Cayley*, presentation, International Symposium on Design and Implementation of Symbolic Computation Systems, Capri, Italy.

1990-03-28: *Computing sylow subgroups in permutation groups*, seminar, Institut für Experimentelle Mathematik, Essen, Germany.

1990-03-05 to 07: Invited participation, Symposium on Symbolic Computation, for 60th birthday of Erwin Engeler, ETH Zürich.

1990-02-01: *Computing sylow subgroups of permutation groups*, seminar, Universität Bayreuth.

1989-09-25: 3rd International Conference on the Theory of Groups and Related Topics, Australian National University, Canberra.

1989-09-02: *Computing sylow subgroups in permutation groups*, invited talk, Miniconference: Computations about groups, Australian National University, Canberra.

1989-07-06: *Cayley: Objects and databases*, seminar, Computer Science, Concordia University, Montreal.

1989-06-23: *Cayley: Objects and databases*, seminar, Rennsalaer Polytechnic Institute, Troy, NY.

1989-06-15: *An introduction to computational group theory*, tutorial minicourse, Computers and Mathematics Conference, Boston.

1989-06-13: *Cayley, version 4*, presentation, Computers and Mathematics Conference, Boston.

1989-04-11: *The research blues*, talk and blues, Basser Brown Bag Lunch, Computer Science, University of Sydney.

1987-07-10: *SETL: An introductory tutorial*, presentation, OTC workshop on formal methods, Sydney.

1987-05-25: 4th International Conference on Logic Programming, Melbourne, Australia.

1986-10-09: *The future of Cayley: Some issues in language and system design*, seminar, Australian National University, Canberra.

1986-07-31: Demonstration of the Cayley system, Computers and Mathematics Conference, Stanford.

1986-07-24: *The future of Cayley: Some issues in language and system design*, seminar, Computer Science, University of Alberta, Edmonton.

1986-07-21: *Divide-and-conquer in computational group theory*, presentation, International Symposium on Symbolic and Algebraic Computation, Waterloo, Canada.

1986-07-17: *The future of Cayley: Some issues in language and system design*, seminar, Computer Science, University of Ottawa.

1986-07-16: *The future of Cayley: Some issues in language and system design*, seminar, Computer Science, McMaster University, Hamilton, Ontario.

1985-12-12: *Permutation groups and p -groups*, invited talk, Computers in Algebra conference, Chicago.

1985-12-11: Demonstration of Cayley system, Computers in Algebra conference, Chicago.

1985-12-03: *Algorithms for p -groups*, Computer Algebra Seminar, University of Delaware, Newark, DE.

1985-11-19: *Some views on the Todd-Coxeter algorithm*, Computer Algebra Seminar, University of Delaware, Newark, DE.

1985-10-29: *Divide-and-conquer strategies in computational group theory*, seminar, Computer Science, University of Nebraska, Lincoln.

1985-10-28: *Computational group theory*, seminar, Computer Science, University of Nebraska, Lincoln.

1985-10-23: *Divide-and-conquer strategies in computational group theory*, seminar, Computer and Information Sciences, University of Delaware, Newark, DE.

1985-10-11: *Divide-and-conquer strategies in computational group theory*, seminar, Computer Science, McGill University, Montreal.

1985-10-09: *Divide-and-conquer strategies in computational group theory*, seminar, Computer Science, Carleton University, Ottawa.

1985-10-04: *Data structures and algorithms for cyclically extended Schreier vectors*, presentation, 15th Annual Conference on Numerical Mathematics and Computing, Winnipeg, Canada.

1985-09-24: *Algorithms for permutation group homomorphisms*, Computer Algebra Seminar, University of Delaware, Newark, DE.

1985-09-17: *Algorithms for permutation groups*, Computer Algebra Seminar, University of Delaware, Newark, DE.

1985-09-10: *An introduction to computational group theory*, Computer Algebra Seminar, University of Delaware, Newark, DE.

1985-06-24: *Computational group theory*, seminar, Computer Science, DIKU, Copenhagen.

1984-?-?: *Master/slave concurrency*, seminar, Computer Science, Concordia University, Montreal.

1982-07-30 to 08-09: Invited participation, Conference on Computational Group Theory, Durham, UK.

1982-?-?: *Computing with homomorphisms*, seminar, Computer Science, University of Sydney.

1981-08-07: *Double cosets and searching small groups*, presentation, International Symposium on Symbolic and Algebraic Computation, Snowbird, Utah.

1980-?-?: *Computing in matrix groups over finite fields*, seminar, Rutgers University, NJ.

1976-11-?: *Computing in matrix groups over finite fields*, seminar, RWTH Aachen, Germany.

1976-08-11: *The Schreier algorithm for matrix groups*, presentation, International Symposium on Symbolic and Algebraic Computation, Yorktown Heights, NY.

Training of Highly Qualified Personnel

Life-time summary of projects and theses supervised to completion:

- 1 post-doctoral fellow
- 3 Ph.D. theses
- 10 Master's by research
- 10 Master's by major project
- 20 undergraduate projects

Current supervision:

- 0 post-doctoral fellow
- 3 Ph.D. theses
- 17 Master's by research
- 4 Master's by major project
- 0 undergraduate projects

Post-Doctoral Fellows

Indira Adiono Tjandra (1993–95), PhD from Universität Karlsruhe on semantics of computer algebra languages and formal verification of the semantics using knowledge representation and reasoning. He participated in a joint project with Drs Grogono, Shinghal and myself on using knowledge in the automatic processing of software documents. In particular, we looked at analysing data flow diagrams.

Ph. D. Theses

Sridhar Sankarnarayan Iyer (1992), **On Databases and Knowledge-bases for Modern Algebra**. Basser Department of Computer Science, University of Sydney. Present Position: Adjunct professor in Computer Science, Monmouth College, New Jersey, USA.

Frank C.N. Ng (1990), **Ego: An Expandable Goal-Oriented Tutoring System**. (joint supervision with J. Kay and R.J. Kummerfeld) Basser Department of Computer Science, University of Sydney. Present Position: Management level at telecommunications company, Sydney, Australia.

Janet Wiles (1987), **Studies of Problems related to Parallel Distributed Associative Models of Memory**. (joint supervision with J.R. Seberry and L.M. Goldschlager) Basser Department of Computer Science, University of Sydney. Present Position: Senior Lecturer, Departments of Computer Science and Psychology, University of Queensland, St Lucia, Queensland.

Master's Theses

Jinmiao Li (2001), **An Object-Oriented Framework for Extensible Query Optimization**, Department of Computer Science, Concordia University. Present Position: Analyst, telecommunications.

Roger Bernier (2000), **Design of a Zooming Viewer for Statecharts**, Department of Computer Science, Concordia University. Present Position: Analyst, data service provider.

Shawn Delaney (1998), **Reverse Engineering and Optimization of the BLASTP Program**. Department of Computer Science, Concordia University. Present Position: Analyst, pharmaceutical company.

Steven Li (1998), **Re-engineering a B-Tree Implementation using Design Patterns**. Department of Computer Science, Concordia University. Present Position: Analyst/Programmer, aerospace simulation company, Montréal.

Pierre Dénomée (1998), **A Case Study in Documenting and Developing Frameworks**. Department of Computer Science, Concordia University. Present Position: PhD candidate, Concordia University.

Iustin Lazar (1998), **A Multi-level Nearest Neighbour Algorithm for Predicting Protein Secondary Structure**. Department of Computer Science, Concordia University. Present Position: Analyst, biomedical instrumentation and software company, Montréal.

Tania Kharm (1996), **Reengineering Unification and T-Entailment for Mantra in C++**. Department of Computer Science, Concordia University. Present Position: Computer systems distribution, Lebanon.

Dorel Baluta (1995), **A Formal Specification in Z of the Relational Data Model, Version 2, of E. F. Codd**. Department of Computer Science, Concordia University. Present Position: Analyst, financial services company, New York.

John Bignucolo (1991), **PolyAct — A Polymorphic Actor Language**. Basser Department of Computer Science, University of Sydney. Present Position: Systems Analyst, Basser Dept of Computer Science, University of Sydney, Sydney, Australia.

Stephen C. Hirst (1986), **Symbolic Regular Algebra**. Basser Department of Computer Science, University of Sydney. Present Position: Tutor, Basser Dept of Computer Science, University of Sydney, Sydney, Australia.

Master's Reports

Liang Yu (2001), **Truckin' Simulation and Visual Interface**, Department of Computer Science, Concordia University. Present Position: Analyst, North Dakota.

Wael Hassan (2000), **Web Support for Automated Analysis of DNA Sequences**, Department of Computer Science, Concordia University. Present Position: Analyst, telecommunications.

Xioaming Tang (1999), **A Software Tool to Display Message Sequence Charts**. Department of Computer Science, Concordia University. Present Position: Analyst/Programmer, CAE, Montréal.

Georges Ayoub (1998), **Object-Oriented Database Management System Case Study for Declarative Query Language**. Department of Computer Science, Concordia University. Present Position: Analyst/Programmer, IBM Canada, Montréal.

Adrian Cretu (1997), **Use Case Software Development and Testing Using Operational Profiles**. Department of Electrical and Computer Engineering, Concordia University. Present Position: Analyst/Programmer, telecommunications company, Montréal.

Minh Hang Pham (1997), **An Interpreter for Object Comprehension Query Language**. Department of Computer Science, Concordia University. Present Position: Analyst/Programmer, Nortel, Ottawa.

Mohan Rao Tadisetty (1997), **On the Design and Implementation of a Top-Down Datalog Interpreter in C++**. Department of Computer Science, Concordia University. Present Position: Analyst/Programmer, aeronautics telecommunications company, Montréal.

Alexander Lakher (1997), **Object Comprehension Translation for Object-Oriented Databases**. Department of Computer Science, Concordia University. Present Position: Consultant.

Valerie Large (1996), **The Pi-DFD Graphic Interface**. Department of Computer Science, Concordia University. Present Position: Analyst, library information systems company, Montréal.

Alison Greig (1996), **Pi-DFD Graphic Interface: DFD Graphical Analysis within ET++ Framework using CWB Tool**. Department of Computer Science, Concordia University. Present Position: Analyst, telecommunications company, Montréal.

Undergraduate Projects

(2000) Jay Sundaram, *Regulators of metabolism of starch and sugars in yeast*, NSERC Summer scholarship.

(1995) Richard Hopkirk, *Design Patterns in a B-tree Implementation*, COMP490/492 project.

(1995) Giovanni Giolti, *C++ Implementation of Unification*, COMP490 project (supervised with Dr Tjandra).

(1995) Byron Packwood, *C++ Translator for OCL Schema Definitions*, COMP490 project.

(1994) Khanh Tuan Vu and Piotr Przybylski, NSERC Summer students implementing the hB-tree, kd-tree, and MD-tree data structures for multi-dimensional retrieval in C++.

(1994) James Rothman, *Using the World Wide Web to Research C++ Libraries*, COMP490 project.

(1994) Michael Sheng, *A Parser in C++ for a Knowledge Representation Language, Mantra*, COMP490/492 project (supervised with Dr Tjandra).

(1994) Graham Leach, *Documentation and Style for C++ Implementation of a Deductive Database*, COMP490 project.

(1994) Gilles Charles, Object-oriented design and implementation of a processor for a set-theoretic query language, end report for French exchange student.

(1993) David Bauer, A project on specification and C++ implementation of container classes, for COMP490/492.

(1993) Khanh Tuan Vu, NSERC Summer student implementing the hB-tree data structure for multi-dimensional retrieval in C++.

(1989) Charles Brady, **A C Cross Compiler for the Commodore Amiga**. Diploma project, University of Sydney.

(1988) Kannan Rathinam, **Type Inference for a Polymorphic Functional Language**. Honours project, University of Sydney.

(1988) Susan Ley, **A Deductive Database for 2-groups**. Honours project, University of Sydney.

(1988) John Surveyor, **A B-tree Suite in C for Multi-User Databases**. Diploma project, University of Sydney.

(1987) John MacQueen, **An Interpreter for a Polymorphic Functional Language**. Honours project, University of Sydney.

(1984) Adil Amin, **An LL Parser Generator with Error Recovery**. Diploma project, University of Sydney.

(1983) Brad Curry, **McCreight's Algorithm and Circular Strings**. Honours project, University of Sydney.

(1983) Matthew J. Kendall, **Issues in Master/Slave Concurrency**. Honours project, University of Sydney.

Current Graduate Students

Kexing (Michael) Rui (PhD expected 2004), Evolution of frameworks.

Ibrahim Haddad (PhD expected 2003), Architecture for web sites.

Lugang Xu (PhD expected 2002), Architectures and Frameworks for Integrated Data- and Knowledge-Bases.

Wei Hua (Vivien) Liang (Masters by thesis expected 2002), XML Interfaces to Databases.

Xin Shen (Masters by thesis expected 2002), Software architecture.

Radu Deca (Masters by report expected 2002), To be determined.

Jang Hwan Kwon (Masters by report expected 2001), Features of Oracle 8.

Ling Chen (Masters by report expected 2001), Diagrammatic queries.

Xuede Chen (Masters by thesis expected 2001), Diagrammatic queries.

Ashraf Abdel Gaffar (Masters by thesis expected 2001), Design of a Framework for Generalized Index Trees.

Andrea Gantchev (Masters by thesis expected 2001), Object-Oriented Design of a Subsumption Architecture.

Liqian Zou (Masters by thesis), To be determined.

Lin Li (Masters by thesis), To be determined.

Rehhong Luo (Masters by thesis), To be determined.

Bin Shao (Masters by thesis), To be determined.

Ronghua Shu (Masters by thesis), Bioinformatics: To be determined.

Da Wei Huang (Masters by thesis), Bioinformatics: To be determined.

Liusong Yang (Masters by report), Bioinformatics: To be determined.

Yan Yang (Masters by thesis), Bioinformatics: To be determined.

Elizabeth Martinez (Masters by thesis), To be determined.

Teaching

At Concordia I used to coordinate the Software Engineering course; now I sit on the SE Curriculum Committee. I generally teach SOEN 337 Measurement and Metrics in Software Development; COMP 245 Programming Methodology; COMP 354 Software Engineering; and COMP 647 Software Design Methodologies. I have also taught COMP 215 Introduction to Computer Science; COMP 352 Data Structures; and COMP 442 Compiler Design. Three of these courses — COMP 354, COMP 442, COMP 647 — have substantial design projects.

In Sydney, I was usually the year director for third-year courses, though I taught courses at every level. First-year courses were Programming; and Fortran. Second-year courses were Design and Data Structures; and Formal Programming. Third-year courses were Data Structures; Compiler Construction; and Logic Programming. Honours courses were Semantics; Symbolic and Algebraic Computation; and the Colloquia.

The colloquia were introduced by Allan Bromley, Sherman Hwa, and myself to broaden Honours student's exposure to the literature and to improve their critical skills. Topics covered a broad range of technical,

ethical, and social aspects of computer science. Students presented a critique of the literature, and were lead in a discussion of the issues.

In Bayreuth, I taught two courses: Algorithms for Permutation Groups; and Language Design and Implementation.

Service

Major Committees

I served during 1996/98 as an elected member of the Department Personnel Committee (DPC) which is responsible for hiring, reappointment, and promotion. For 1997/98 academic year, I am the Chair of the DPC.

I served as an elected member of the Department Academic Planning and Priorities Committee (DAPPC) in 1994&95 and its subcommittee on curriculum development. The DAPPC advises the Chair on resource allocation, equipment purchases, and on short- and long-term academic planning.

As a year director at Sydney, I served on the department's executive committee, which reviewed all recommendations from the teaching, research, and resources committees.

I am a member of the Centre for Structural and Functional Genomics. I was a member of the executive of Centre Interuniversitaire en Calcul Mathématique Algébrique (CICMA), a research center for computational mathematics that involves three universities and four departments. As Vice-Director, Computing, I coordinate equipment grant applications, equipment purchases, and the operation of the facilities.

Curriculum Development

In 1998, we designed the curriculum for a four-year accredited Bachelor of Software Engineering degree. The development was led by Peter Grogono with major contributions from myself, Ferhat Khendek, and Michel de Champlain. As a member of the Curriculum Committee, and the Software Engineering Curriculum Committee I am involved in the fine tuning of the curriculum.

In 1994&95 I was heavily involved as a member of the Curriculum Committee during a major overhaul of the undergraduate, graduate, and diploma curricula. At the undergraduate level this lead to a strengthened core of courses and to simplified selection of electives, while allowing joint degrees to be easily accommodated. A second, elective, software engineering course was added to build on the core software engineering course.

The COMP 354 Software Engineering course involves a group project, usually three to four groups of about 10 students, where they experience the software development process. I have focussed the lectures more in support of the project, and introduced material on use cases, object-oriented development, software architectures, testing, and C++. At the same time I have included unifying material on principles, vision and priorities, and on quality control.

For COMP 647, I teach object-oriented design, using a small design project done in teams of three to five. The course is highly interactive and manages to incorporate discussions of software architecture, frameworks, design patterns, and issue-driven design.

At Sydney I contributed significantly to reviews of curricula: in 1986 I was a prime motivator in a protracted major review of the third-year course syllabus that recognised the importance of Communications and Networks, Cryptography, and Computer Security.

The Honours course on *Symbolic and algebraic computation* was the first course at the University of Sydney to treat the topic when I introduced it in 1983. From 1986, the course covered the design and construction of sac systems. I designed a small language, MiniCayley, to illustrate the problems of coercion, overloading, and inheritance for object-oriented sac systems.

With Norman Foo, I introduced a course on *semantics* for Honours; and with Allan Bromley and Sherman Hwa, I introduced a series of *colloquia* covering a broad range of technical, ethical, and social aspects of computer science.

In 1982 I redesigned the practical work for *CS1 programming* to emphasise stepwise refinement. A five-stage assignment introducing relational databases (in a simplified form) was developed. It was replaced in 1983 by a five-stage assignment for a simulator for a microcoded cpu instruction set. In 1986-7 I designed the *CS2 programming and data structures* course to present the issues of programming large software systems, explain the importance of understanding the data and information involved, and emphasise the role of abstraction or information hiding in controlling complexity.

Other Service

My service to the Department includes membership on the Undergraduate Advisory Committee, the Coop Committee, the Graduate Advisory Committee, and the ad-hoc committee on the departmental mission statement. I was a member of the Writing Committee, and played a major role in the writing of the Department's Self-Appraisal Dossier in 1994.

At Sydney I competently and conscientiously performed a variety of administrative duties, including library liaison, room bookings, public relations, research seminar organisation, and year director. I have served on departmental and university selection committees, the Science Faculty Library Committee, and the University Orientation Management Committee at the University of Sydney.

As year director for CS3 in 1984 and 1986-88, I managed the teaching and equipment resources relevant to the third-year courses. This included the preliminary allocation of lecturing staff to courses, orientating lecturers with new courses, budgetting the demands for tutorial staff and equipment, troubleshooting any problems with the running of the courses, coordinating the assessment of the courses and the final grades for students in the year, forward estimates for equipment, and coordinating proposals for changes to the curricula which affect the courses of that year. There were up to 200 third-year students from the Arts, Science, Engineering, and Economics faculties. They took a wide range of options, and there were many consultations to advise them.

I was year director for Honours in 1989, and was acting director for CS2, CS3, and Honours on several occasions which included the periods of examiners' meetings, handbook entry preparation, and the supervision of supplementary examinations.

Professional Activities

Journal Editor: *Applicable Algebra in Engineering, Communication and Computing*.

Journal referee: *Software — Practice and Experience*; *Journal of Symbolic Computation*; *Applicable Algebra in Engineering, Communication and Computing*; *Discrete Mathematics*.

Conference referee: *Artificial Intelligence and Symbolic Computation (AISC)*; *International Symposium on Symbolic and Algebraic Computation (ISSAC)*; *Algebraic Methodology and Software Technology (AMAST)*; *Design and Implementation of Symbolic Computation Systems (DISCO)*; *Artificial Intelligence and Symbolic Mathematical Computation (AISMC)*; *Formal Power Series and Algebraic Combinatorics (FPSAC)*.

Grant referee: *Natural Sciences and Engineering Research Council*, *National Science Foundation*; *Australian Research Council*; *University of Queensland*; *Concordia University*.

Program co-chair: *Conference on Generative and Component-Based Software Engineering*, Erfurt, October 9-12, 2000.

Co-organizer: *Workshop on Generative Techniques in Product Lines*, *International Conference on Software Engineering*, Toronto, May 12-19, 2001.

Co-organizer: *Workshop on Managing and Integrating Biochemical Data*, *European Media Lab*, September 25-26, 2000.

Co-organizer: *Workshop on Generative Techniques in Product Lines*, *First Software Product Line Conference*, Denver, August 29, 2000.

Local Organizer: *ISSAC'95*.

Program Committee: *SSDBM'2001*, *AISC'2000*, *LMO'2000*, *AISC'98*, *ISSAC'94*, *AISMC-3*.