CHAPTER 1

Ken Sevcik as an Advisor and Mentor

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Ken Sevcik joined the Computer Science faculty at the University of Toronto in 1971, following his doctoral studies at the University of Chicago and his bachelor's studies at Stanford. Like many of Toronto's early hires in Computer Science, Ken was persuaded by then-chair Tom Hull to "give it a try for a couple of years," which became a career.

The four of us are privileged to have been among Ken's early Ph.D. students — numbers 2, 3, 5, and 8 of his 22 Ph.D. students as of 2004 (see Table 1). Ken also graduated 50 M.Sc. students as of 2004 (see Table 2), and the 7 of his 22 Ph.D. students who pursued academic careers have given him, thus far, 61 Ph.D. grandchildren, 86 great grandchildren, 32 great great grandchildren, and 2 great great great grandchildren (see Fig. 1) — a total of 203 Ph.D. descendants in all!

As faculty members ourselves, we often reflect on the characteristics that made Ken such a successful advisor and mentor, and try as best we can to emulate them.

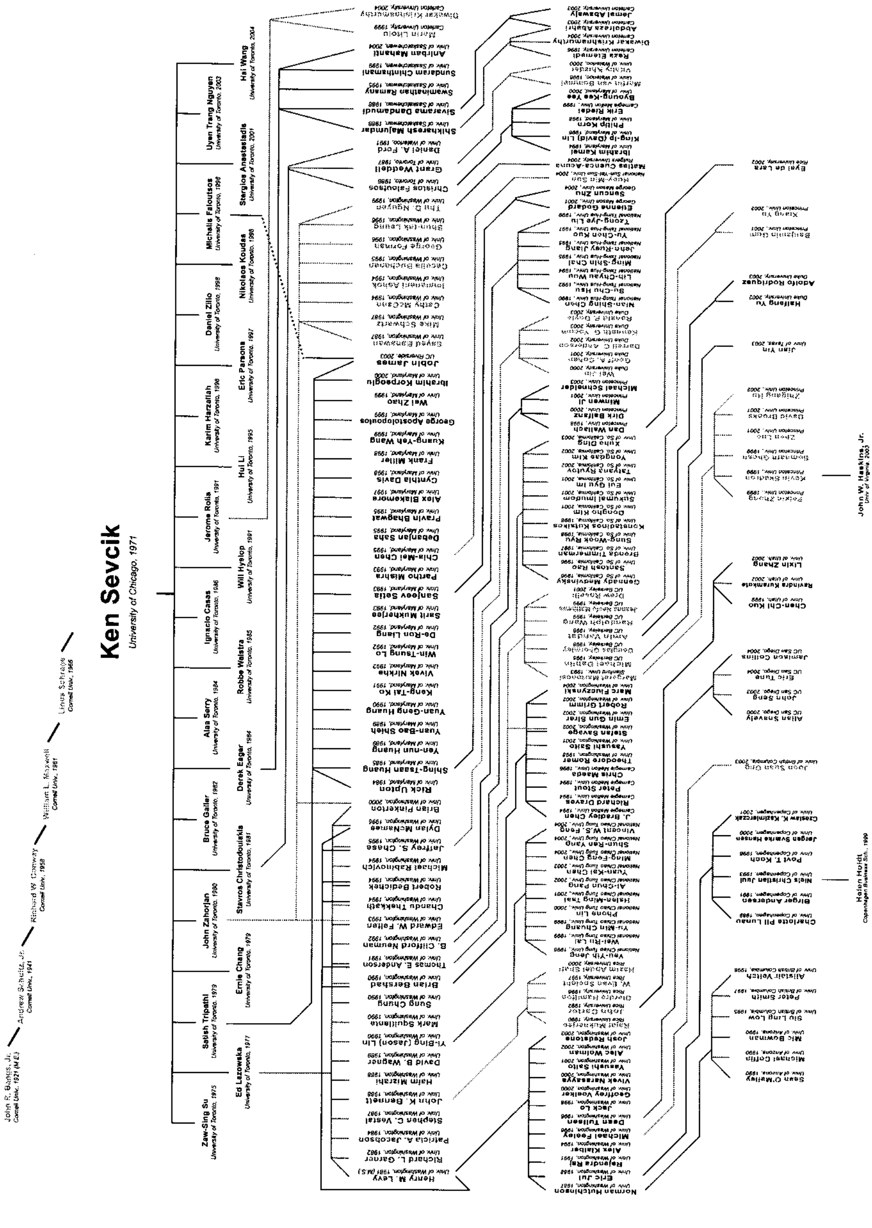

Fig. 1. Ken Sevcik's Ph.D. genealogy.

Table 1. Ken Sevcik's Ph.D. students.

1. Su, Zaw-Sing, *Dynamic Scheduling with Preemption: A Deterministic Approach* (1975)
2. Lazowska, Edward D., *Characterizing Service Time and Response Time Distributions in Queueing Network Models of Computer Systems* (1977)
3. Tripathi, Satish K., *On Approximate Solution Techniques for Queueing Network Models of Computer Systems* (1979)
4. Chang, Ernie, *Decentralized Algorithms in Distributed Systems* (1979)
5. Zahorjan, John, *The Approximate Solution of Very Large Queueing Network Models* (1980)
6. Christodoulakis, Stavros, *Estimating Selectivities in Data Bases* (1981)
7. Galler, Bruce, *Concurrency Control Performance Issues* (1982)
8. Eager, Derek, *Bounding Algorithms for Queueing Network Models of Computer Systems* (1984)
9. Serry, Alaa, *An Analytical Approach to Modelling IMS Systems* (1984)
10. Walstra, B. Robbe J., *Iterative Analysis of Networks of Queues* (1985)
11. Casas-Raposo, Ignacio, *PROPHET: A Layered Analytical Model for Performance Prediction of Database Systems* (1986)
12. Hyslop, William, *Performance Prediction of Relational Database Management Systems* (1991)
13. Rolia, Jerome, *Predicting the Performance of Software Systems* (1991)
14. Li, Hui, *Software Approaches to Memory Latency Reduction on NUMA Multiprocessors* (1995)
15. Harzallah, Karim, *Impact of Memory Contention in Large Scale Multiprocessors* (1996)
16. Parsons, Eric, *Coordinated Allocation of Processors and Memory in Multiprocessor Operating Systems* (1997)
17. Zilio, Daniel, *Physical Database Design Decision Algorithms and Concurrent Reorganization for Parallel Database Systems* (1998)
18. Koudas, Nikolaos, *Fast Algorithms for Spatial and Multidimensional Joins* (1998)
19. Faloutsos, Michalis, *The Greedy, The Naive, and The Optimal Multicast Routing: From Theory to Internet Protocols* (1998) [co-supervised with A. Banerjea]
20. Anastasiadis, Stergios, *Supporting Variable Bit-Rate Streams in a Scalable Continuous Media Server* (2001) [co-supervised with M. Stumm]
21. Nguyen, Uyen Trang, *Congestion Control for Multipoint Communications in ATM Networks* (2003) [co-supervised with I. Katzela]
22. Wang, Hai, *Concise and Accurate Data Summaries for Fast Approximate Query Answering* (2004)

Ken was open and approachable. When you met Ken, whether for the first time or the thousandth, you could count on being received with a smile. No matter how busy Ken was, while you were talking with him that conversation had his full attention. No matter how naïve what you had to say was, he gave full consideration (before gently pointing out what might be wrong with it).

Table 2. Ken Sevcik's M.Sc. students.

1. Tran, Tuan Khan, *The Response Time Distributions of Some Computer Scheduling Disciplines* (1972)
2. Lester, Eleanor A., *The Investigation of Service Time Distributions* (1973)
3. Lazowska, Edward D., *Scheduling Multiple Resource Computer Systems* (1974)
4. Lam, Lettice Hung, *Comparison of Three Logical Views of Data in Hospital Information Systems* (1974)
5. Schumacher, Helmut, *The Synthesis of Optimal Decision Trees from Decision Tables* (1974)
6. Tripathi, Satish, K., *Approximate Models of Multi-Programmed Computer Systems with Paging* (1975)
7. Lum, Wade C., *Data Collection, Reduction and Analysis of Computer System Measurement* (1975)
8. Cheung, Stephen Chun-Lap, *A Computer Method for Cyclical Scheduling of Shift Workers* (1975)
9. Shen, Helen, *The Effect of Interarrival Times in Scheduling* (1975)
10. Spirk, Franz, *An Analysis of Different Deadlock Control Schemes* (1975)
11. Lin, Hing-Lung, *Closed Queueing Network Models: Computational Algorithms with Application to Computer System Performance Evaluation* (1976)
12. Dubien, Ronald J., *Extending a Commercial Database System to Provide Data Independence* (1977)
13. Kienzle, Martin G., *Measurements of Computer Systems for Queueing Network Models* (1977)
14. Kidd, Robert John, *A Common Model for Multi-Key Access Performance Evaluation* (1978)
15. Lai, Chi Sang, *Patient Identification and Record Linkage* (1979)
16. Au, Matthew, *Some Properties of Queueing Network Models* (1981)
17. Bell, Barbara, *Database System Performance Prediction: The First Two Levels of a Multi-level Modelling Framework* (1981)
18. Casas-Raposo, Ignacio, *Analytic Modelling of Database Systems: The Design of a System 2000 Performance Predictor* (1981)
19. Eager, Derek, *Robust Concurrency Control in Distributed Databases* (1981)
20. Bobrowski, Christoph, *The Principle of Maximum Entropy in Some Computer System Modelling Problems* (1983)
21. Vopalensky, Jan, *The Scheduling Problem in Distributed Computer Systems: Its Definition and Partial Solution* (1983)
22. Martin, Vickie, *SPIRAL ONE — Dynamic Hashing Scheme* (1983)
23. Aldwinckle, John, *A Scheduler for UNIX* (1984)
24. Gelblum, Michael, *Some Results of the File Placement Problem* (1984)
25. Rolia, Jerome, *Performance Estimates for Multi-tasking Software Systems* (1987)
26. Coatta, Terry, *Queueing Networks with State-Dependent Service Rates* (1987)
27. Clark, Graeme, *Performance Properties of the FDDI Token Ring* (1987)
28. MacLean, Richard, *Performance Characteristics of the FDDI Token Ring Priority Mechanism* (1989)
29. Lee, Jei-min, *Concurrency Control Through Hierarchical Synchronization* (1989)
30. LeBel, Edgar, *Sparse Undistributed Memory: A Local Storage Model for Pattern Matching* (1990)
31. Cupit, Brian, *Parse Tree Based Revision Control and Program File Compression* (1990)
32. Verma, Raj, *A Metric Approach to Isolated Word Recognition* (1991)

Table 2. (*Continued*)

33.	Srikantiah, Nandini, *Processor Scheduling in Hierarchical NUMA Multiprocessors* (1991)
34.	Bacque, Ben, *SUPERMON: Flexible Hardware for Performance Monitoring* (1991) [co-supervised with K. C. Smith]
35.	Marwood, Simon, *Performance Comparison of Concurrency Control Techniques in Partitioned Systems* (1993)
36.	Wu, Chee Shong, *Processor Scheduling in Multiprogrammed Shared Memory Computer Systems* (1993)
37.	Larson, Johan, *Domain-Partitioned Parallel Sort-Merge Join* (1995)
38.	Wang, Corina, *An Adaptive Rendering and Display Model for Networked Applications* (1996) [co-supervised with M. van de Panne]
39.	Tam, Anita, *Performance Prediction for Parallel Applications* (1996)
40.	Anastasiadis, Stergios, *Parallel Application Scheduling on Networks of Workstations* (1996)
41.	Soreanu, Gabriel, *A Comparative Study of Interconnection Networks in Large-Scale Multiprocessors* (1996)
42.	Wang, Hai, *Approximate MVA Algorithms for Solving Queueing Network Models* (1997)
43.	Gibbons, Richard, *A Historical Application Profiler for Use by Parallel Schedulers* (1997)
44.	Kennedy, Brett, *Declustering Spatial Data for Range and Join Queries* (1999)
45.	Piegaze, Peeter, *Incorporating Time into Computer Cartography: A Digital Atlas of History* (2001)
46.	Lu, Jingjing, *Fast Algorithms for Distance-Based Spatial Queries* (2001)
47.	Garcia Arellano, Christian, *Quantization Techniques for Similarity Search in High-Dimensional Data Spaces* (2002)
48.	Tjioe, Wei, *Finding Structure in Data* (2003)
49.	Pham, Hang, *Accurate Two-Dimensional Histograms for Fast Approximate Answers To Queries on Real Data* (2004)
50.	Dong, Junfeng, *Indexing High-Dimensional Data for Main Memory* (2004)

Ken was incredibly conscientious. As a student, you need many things from your advisor (including many things you do not know you need, but you do). You could count on Ken to provide these, both the good (e.g., introducing you to the community at conferences) and the bad (e.g., insisting that your thesis really did need another chapter's worth of work before it was complete). You could count on him looking out for your welfare, even when the effort to do so benefited him at most extremely indirectly.

Ken led by example. He engaged in all the aspects of the work that a student had to learn to do, as well as those carried only by the advisor. He set high standards for his students, and even higher ones for himself.

Ken was always open to new ideas and new approaches, and eager to learn new things. His willingness to tackle new problem areas was evident from the titles of the Ph.D. and M.Sc. theses that he supervised: scheduling theory, queueing network modeling techniques, distributed algorithms, database management systems, applications of performance models, multiprocessor architecture, multiprocessor operating systems, communication network protocols, computer system performance measurement, file structures, spatial databases, and many more.

Finally, Ken managed to be our friend as well as our advisor, without letting either of those relationships interfere with the other. This is at the heart of the immense respect we have for him, both professionally and personally. In the final tally, how well one has done as an advisor is reflected in how much one's students have learned. We owe Ken a terrific debt for the lessons he gave us about performing and leading research, and about how to lead our lives.