

## Curriculum Vitae of Andrew S. Tanenbaum

### Full Name

Andrew Stuart Tanenbaum

### Address

Dept. of Computer Science  
Faculty of Sciences  
Vrije Universiteit  
De Boelelaan 1081A  
1081 HV Amsterdam, The Netherlands

### Telephone Numbers/Email

+31 20 444-7780 (voice)  
ast@cs.vu.nl (email)

### Date and Place of Birth

16 March 1944, New York City

### Citizenship

US

### Education

Ph. D., University of California, Berkeley, 1971  
S. B., M.I.T., 1965  
White Plains High School, White Plains, N.Y., 1961

### Employment

March 2014 - present: Professor emeritus and guest professor, Vrije Universiteit  
June 1973 - March 2014: Vrije Universiteit, Amsterdam  
Sep. 1971 - June 1973: Vrije Universiteit, Amsterdam (half time)  
Oct. 1971 - June 1973: Mathematisch Centrum, Amsterdam (half time)

### Extended Visits to Universities and Research Laboratories

Consultant to Bell Laboratories, Murray Hill, NJ, July-Aug. 1983.  
Consultant to Bell Laboratories, Murray Hill, NJ, Aug. 1980.  
Consultant to Bell Laboratories, Murray Hill, NJ, June-Aug 1979.  
Visiting Scholar, University of Guelph, Ontario, Jan. 1979.

### Research Interests

Dependable and secure operating systems  
Distributed and parallel systems  
Computer and Internet security

## **Courses Taught**

- Computer Networks
- Computer Organization
- Distributed Systems
- Grant Proposal Writing
- Operating Systems
- Programming Languages

## **Memberships**

- ACM (Fellow)
- IEEE Computer Society (Fellow)
- Sigma Xi

## **Professional Activities**

- Scientific Director, Advanced School for Computing and Imaging
- Member, Editorial Board, *The Computer Journal*
- Referee for *Communications of the ACM*
- Referee for *Euromicro Conference*
- Referee for *Computer Networks*
- Referee for *Computer Journal*
- Reviewer for U.S. National Science Foundation
- Reviewer for Canadian Science Research Council
- Reviewer for Australian CSIRO
- Reviewer for Dutch NWO
- Jury member for STW
- Program Chairman, Seventh ACM SIGOPS European Workshop, 1996
- Member of various program committees for conferences
- Head of NWO steering committee for Digital Information SuperHighway

## **University Service**

- Vice dean of Faculty of Mathematics and Computer Science
- Head of Computer Systems Section
- Chairman of Faculty Web Committee
- Department of Math & Computer Research Committee
- Chairman of Math & Computer Science Promotion Committee
- Computer Science Group Management Committee
- University Computer Center Equipment Committee
- Math and Computer Science Library Committee

## **Honorary Doctorates**

Honorary doctorate, Petru Maior University, 2011  
Honorary doctorate, Polytechnic University of Bucharest, 2008

## **Honors and Awards**

ACM EUROSYS Lifetime Achievement Award, 2015  
TAA McGuffey Award winner, 2010  
USENIX Flame Award for Lifetime Achievement, 2008  
Winner of European Research Council Advanced Grant, 2008  
Co-author of Best Paper Award, Real-Time and Network Systems, 2008  
NLUUG Lifetime Achievement Award, 2008  
IEEE James H. Mulligan, Jr. Education Award, 2007  
Co-author of Best Paper Award, Dependable Systems and Networks, 2007  
Finalist Internet Society of the Netherlands Privacy and Security Award, 2006  
Co-author of Best Paper Award, LISA 2006  
Co-author of Best Paper Award, PerCom 2006  
KNAW Academy Professor 2004  
TAA McGuffey Award winner, 2003  
NGI Van Wijngaarden Medal, 2002  
TAA Texty Award winner, 2002  
Fellow of the IEEE, 1997  
Honorary Chairman, IEEE ICDCS Conference, 1997  
ACM SIG on Computer Science Education, Outstanding Educator Award, 1997  
Fellow of the ACM, 1995  
ACM Karl V. Karlstrom Educator of the Year Award, 1994  
Elected to membership in the Royal Netherlands Academy of Arts and Sciences, 1994  
Senior Member of the IEEE, 1994  
Listed in *Who's Who in the World 1993-1994*  
Member, New York Academy of Sciences, 1992  
Distinguished Paper Award, ACM Tenth Symposium on O.S. Principles, 1985  
Distinguished Lecture Award, Stanford University, 1985.  
Scholarship to Advanced Course on Operating Systems, Munich, March 1978  
Scholarship to Advanced Course on Software Engineering, Munich, Feb. 1972  
National Science Foundation Traineeship, 1965-69  
National Honor Society Scholarship, 1961  
New York State Regents Science Scholarship, 1961

## **Statistics from scholar.google.com**

H-index: 70  
Citations: 32,907

### **Ph.D. Theses Supervised**

- Van der Kouwe, E. *Improving Software Fault Injection*, 2016.
- Hruby, T. *On the Design of Reliable and Scalable Networked Systems*, 2016  
(co-supervised with Herbert Bos).
- Van 't Noordende, G. *The Design and Implementation of the Mansion Mobile Agent System*, 2015  
(co-supervised with Frances Brazier).
- Appuswamy, R. *Building a File-Based Storage Stack*, 2014.
- Giuffrida, C. *Safe and Automatic Live Update*, 2014.
- Ortolani, S. *Keylogger Detection and Containment*, 2013  
(co-supervised with Bruno Crispo).
- Herder, J. *Building a Dependable Operating System*, 2010  
(co-supervised with Herbert Bos).
- Nair, S. *Remote Policy Enforcement Using Java Virtual Machine*, 2010.  
(co-supervised with Bruno Crispo).
- Rieback, M.R. *Security and Privacy of Radio Frequency Identification*, 2008  
(co-supervised with Bruno Crispo).
- Popescu, B.C. *The Design and Implementation of a Secure Wide-Area Object Middleware*, 2007  
(co-supervised with Bruno Crispo).
- Oey, M.A. *The Design of a High-Integrity Disk Management Subsystem*, 2005  
(co-supervised with Wiebren de Jonge).
- Ballintijn, G.C., *Locating Objects in a Wide-area System*, 2003  
(co-supervised with Maarten van Steen).
- Vogels, W.H.P. *Scalable Cluster Technologies for Mission-Critical Enterprise Computing*, 2003  
(co-supervised with Henri Bal).
- Bakker, A. *An Object-Based Software Distribution Network*, 2003  
(co-supervised with Maarten van Steen).
- Homburg, P.C. *The Architecture of a Worldwide Distributed System*, 2001  
(co-supervised with Maarten van Steen).
- Doorn, L. van *The Design and Application of an Extensible Operating System*, 2001.
- Bhoedjang, R.A.F. *Communication Architectures for Parallel-Programming Systems*, 2000  
(co-supervised with Henri Bal).
- Kaashoek, M.F. *Group Communication in Distributed Computer Systems*, 1992.
- Baalbergen, E. *The Declarative Operating System Model*, 1992  
(co-supervised with Dick Grune).
- Bal, H.E. *The Shared Data Object Model as a Paradigm for Programming Distributed Systems*, 1989.
- Renesse, R. van *Functional Processing as a Paradigm for Distributed Computing*, 1989.
- Mullender, S.J. *Principles of Distributed Operating System Design*, 1985.

### **Masters Theses Supervised**

- Iorgulescu, C.: *Safe and Automatic Live Update for Unix Applications*, 2013.
- Kuijsten, A.: "Polymorphic Operating Systems" , 2012.
- Linnenbank, N.: "Implementing Minix on the Single Chip Cloud Computer" , 2011.
- Kouwe, E. van der: *Porting the QEMU Virtualization Software to MINIX 3*, 2009.
- Veerman, T.: *Dynamic Updates and Failure Resistance for the MINIX File System*, 2009.
- Moolenbroek, D. van: "Multimedia Support for MINIX 3" , 2007.
- Meurs, R.: *Building Performance Measurement Tools for the MINIX 3 Operating System*, 2006.

- Gerofi, B.: *Design and Implementation of the MINIX Virtual File System*, 2006.
- Alting, I., *A Port of the MINIX OS to the PowerPC Platform*, 2006.
- Herder, J.N., *Towards a True Microkernel Operating System*, 2005.
- Timmer, R.J., *An Efficient Implementation of the Agent Operating Systems*, 2005.
- Driel, M. van, *Porting MINIX to the Sharp Zaurus*, 2005.
- Balogh, A., *A General Method for Encapsulating Processes*, 2003.
- Sacha, J., *Securely Replicated Web Documents*, 2003.
- Zeeman, T., *Mansion: A prototype Implementation*, 2003.
- Evertse, M. *The Design and Implementation of a Secure Globe Object Server*, 2003.
- Gil, T. *MULTOPS: A Data Structure for Denial of Service Attack Detection*, 2001.
- Prevenier, M. *CD-ROM and Sound card Drivers for MINIX and Amoeba*, 1995.
- Berwald, R.: *A Replicated Fault-Tolerant Authentication Server for Amoeba*, 1994.
- Oussoren, R. *MinFS: An NFS-like Remote File System for MINIX*, 1995.
- Visser, R. *Making Amoeba POSIX Conformant*. 1993.
- Wams, J.-M. *POSIX Conformance Testing for MINIX*, 1992.
- Beugel, B.J. *Verifying Amoeba*, 1991.
- Hendriks, S., and van Scheppingen, R. van *The SWAN Server for the Amoeba Distributed OS*, 1990.
- Kaashoek, M.F. *An Evaluation of the Distributed Data Structure Paradigm in Linda*, 1988.
- Winkel, J.C. van *Computer Viruses*, 1988.
- Leersum, W. van *Porting the Unix-like Operating System MINIX to the IBM PS/2 Model 30*, 1988.
- Mullender, K.S. *The Amoeba Wide Area Gateway*, 1988.
- Drenth, G.D., and Wilcke, M. *Monitoring in Distributed Client—Server Environments*, 1988
- Schrander, A.J., and Otten, J.W. van *The Bulletin Board: A Tool for Impl, Parallel Algs.*, 1988.
- Moolen, R.J. *Comparison of Five Very High Level Languages*, 1987.
- Renesse, R. van *The Evolution of Amoeba* 1985.
- Baalbergen, E., and Waage, M. *The CEM Compiler*, 1985.
- Bekema, L.J. *The Common Subexpression Elimination Phase of the EM Global Optimizer*, 1985.
- Huntjens, M. *Service registratie en beheersing in het Amoeba gedistribueerde bedrijfssysteem*, 1985.
- Storm, T.W. *Link Server and File Server, Two Amoeba Style Servers on UNIX*, 1985.
- Buskermolen, G. *Back End Table for the Intel 8080 Microprocessor*, 1984.
- Dalen, J. van *A Back End Table for the 6500 Microprocessor*, 1984.
- Haarlem, F. van *A Back End Table for the Zilog Z80 Microprocessor*, 1984.
- Meer, T.J. van and Welman, C.G.M. *A Capability Server for the Amoeba Distributed OS*, 1984,
- Voors, J. *A Back End Table for the Zilog Z8000 Micro*, 1984.
- Brazier, F. *Executie Efficiëntie van een EM interpretator op de Z80*, 1983.
- Dol, C. *Extending UNIX to Microprocessors*, 1983.
- Jorissen, J., and Gutter, J. *A Transaction Layer for Amoeba*, 1983.
- Staveren, J.M. *Een taal- en machine-onafhankelijke optimalisator*, 1983.
- Biekart, D. and Janssen, A. *The Implementation of a File System for Amoeba*, 1982.

## **Honors and Awards Won by My Ph.D. Students**

Many of my Ph.D. students have become very successful in academia and industry, for example:

Frans Kaashoek is a full professor at M.I.T.

Sape Mullender is a full professor at TU Twente

Henri Bal is a full professor at the VU

Robbert van Renesse is a senior researcher at Cornell University

Werner Vogels is CTO of Amazon.com

Leendert van Doorn is a senior executive at Microsoft

Melanie Rieback is founder and CEO of a startup in the area of computer security

Cristiano Giuffrida is an assistant professor at the VU

They have also won a number of awards, for example:

Cristiano Giuffrida - ACM SIGOPS Dennis M. Ritchie Award, 2015

Cristiano Giuffrida - ACM Eurosys Roger Needham Award, 2014

Henri Bal - Euro-Par Achievement Award, 2014

Henri Bal - Member of Academia Europeana, 2013

Frans Kaashoek - Member of the U.S. National Academy of Arts and Sciences, 2012

Jorrit Herder - ACM Eurosys Roger Needham Award, 2011

Frans Kaashoek - ACM-Infosys Foundation Award, 2010

Robbert van Renesse - ACM Fellow, 2009

Melanie Rieback - VU Mediakomeet, 2007

Melanie Rieback - NWO I/O Award, 2006

Frans Kaashoek - Member of the U.S. National Academy of Engineering, 2006

Frans Kaashoek - ACM Fellow, 2004

Frans Kaashoek - Mark Weiser Award, 2001

## **Keynote Addresses I Have presented at Conferences**

1. FROSCON 2015, Sankt Augustin, Germany, 22 Aug. 2015,  
"MINIX 3: A Reliable and Secure Operating System."
2. BSDCan 2015, Ottawa, Canada, 12 June 2015,  
"Reimplementing NetBSD Based on a Microkernel."
3. HAXPO 2015, Amsterdam, 28 May 2015,  
"MINIX 3: A Reliable and Secure Operating System."
4. Codemotion 2015, Rome, 28 March 2015,  
"MINIX 3: A Reliable and Secure Operating System."
5. Geodan, Amsterdam, 18 Dec. 2014,  
"Where Have We Been and Where Are We Going?"
6. 30 Years of Informatica in Sweden, Linkoping University, 26 Sept. 2013,  
"30 Years of Computer Science."
7. SIREN 2010 Veldhoven, The Netherlands, 2 Nov. 2010,  
"Recent Developments in Computer Systems."
8. FOSDEM Brussels, Belgium, 7 Feb. 2010,  
"MINIX 3: A Modular, Self-healing, POSIX-compatible Operating System."
9. NSCNE '09 Changsha, China, 5 Nov 2009,  
"Ten Golden Rules for Teaching Computer Science."
10. E-Democracy 2009 Conference Athens, Greece, 25 Sept 2009,  
"Democracy Meets the Internet."
11. Free and Open Source Conference Sankt Augustin, Germany, 23 Aug. 2008,  
"MINIX 3: An Open-source Operating System."
12. XV Semana Informatica of the Instituto Superior Tecnico, Lisbon, Portugal, 13 March 2008,  
"MINIX 3: A Reliable and Secure Operating System."
13. NLUUG 25 year anniversary conference, Amsterdam, 7 Nov, 2007,  
"25 Years of Computer Science."
14. Linux Conference, Sydney, Australia, 17 Jan. 2007,  
"MINIX 3: A Reliable and Secure Operating System."
15. Academic IT Festival in Cracow, Poland, 23 Feb 2006,  
"MINIX 3: A Reliable and Secure Operating System."

16. ACM Symposium on Operating System Principles, Brighton, England, 24 Oct. 2005,  
"Would You Run Windows on Your Grandmother's Pacemaker?"
17. ASCI 2004, Ouddorp, The Netherlands, 2 June 2004,  
"Where Are We Going?"
18. 18th Int'l Conf. on Distributed Computing Systems, Amsterdam, 27 May 1998,  
"The Design of a Billion-User Worldwide Distributed System"
19. ACM SIGCSE '97, San Jose, CA., 27 Feb. 1997,  
"Ten Golden Rules for Teaching Computer Science"
20. NLUUG Spring Conf., Ede, The Netherlands, 12 April 1995,  
"New Frontiers in Networking."
21. 14th Int'l Conf. on Distributed Computing Systems, Poznan, Poland, 22 June 1994,  
"Distributed Operating Systems: Past, Present, Future."
22. Second Int'l Symp. on High-Performance Distributed Systems, Spokane, WA, 21 July 1993,  
"Programming a Distributed System Using Shared Objects."
23. OpenForum Conf., Utrecht, 25 Nov. 1992,  
"Distributed Operating Systems Anno 1992: What have we Learned so Far?"
24. Workshop on Distributed Operating Systems, Tokyo, 16 Jan. 1991,  
"The Amoeba Distributed Operating System."
25. Europen Conf., London, 13 July 1990,  
"Beyond UNIX--A True Distributed System for the 1990s."
26. Sixth Symp. Reliability in Distr. Softw. and Database Systems, Williamsburg, VA, 17 March 1987,  
"Reliability Issues in Distributed Operating Systems."
27. EUUG Conf., Stockholm, 13 May 1987,  
"MINIX - A UNIX Clone with Source Code."
28. NLUUG UNIX Conf., Ede, 30 May 1986,  
"MINIX - A Rewrite of UNIX for the IBM PC."
29. Computing in High Energy Physics, Amsterdam, 25 June 1985,  
"Current Research on Distributed Operating Systems."
30. Eighth Australian Computer Science Conf., Melbourne, 7 Feb 1985,  
"A Survey of Current Research on Distributed Operating Systems."



31. Conf. on Fifth Generation and Super Computers, Rotterdam, 12 Dec. 1984,  
"Amoeba - A Multicomputer Distributed Operating System."
32. Workshop on Distributed Computing Systems, Mont St. Michel, France, 27 Sept. 1983,  
"A File Server Using Optimistic Concurrency Control."
33. Distributed Computer Systems Symp., Kath. University, Leuven, Belgium, 25 Feb. 1983,  
"Design of a Capability-Based Distributed Operating System."
34. 12th EUUG Conf., Leeds, England, 6 Sept 1982,  
"Design and Structure of an Open Distributed Operating System."
35. Second Int'l Symposium on Distributed Data Bases, Berlin 3 Sept. 1982,  
"Operating System Requirements for Distributed Data Base Systems."
36. Nieuwe Ontwikkelingen in Computerprogrammatuur, Utrecht, 7 May 1982,  
"Operating Systems in the Eighties."
37. Local Networks and Distributed Office Systems, London, 12 May 1981,  
"Amoeba - A Capability-Based Distributed Operating System."
38. Conf. on Experiences with Pascal, Goteborg, Sweden, 4 June 1980,  
"A Tool Kit for Making Compilers for Pascal like Languages."
39. Ned. Genootschap voor Informatica Spring Symposium, Veldhoven, 27 May 1980,  
"The Future of Distributed Computer Architecture."
40. Ned. Genootschap voor Informatica, Utrecht, 10 May 1979,  
"System Programming Languages."

**Invited Addresses I Have presented as an ACM Distinguished Speaker**

1. Federico II University of Naples, Naples, Italy, 30 Nov. 2016.
2. Jagiellonia University, Cracow, Poland, March 16, 2017.
3. University of Oporto, Oporto, Portugal, 24 March 2018.

## **Contributed Papers I Have Presented at Conferences**

1. Devovx, Antwerp, Belgium, Nov. 12, 2015,  
"MINIX 3: A Reliable and Secure Operating System."
2. EuroBSDCon, Sofia, Bulgaria, 27 Sept. 2014,  
"Reimplementing NetBSD Based on a Microkernel"
3. Int'l Workshop on Object-Oriented Operating Systems,  
"Programming Multicomputers Using Shared Objects."  
IEEE, Asheville, NC, 9 Dec. 1993.
4. Cabernet Workshop, Toulouse, France, 24 March 1992,  
"Distributed Systems Research at the Vrije Universiteit."
5. 12th Symposium on Operating Systems Principles, Phoenix Arizona, 6 Dec. 1989,  
"Broadcasting as an Operating System Paradigm."
6. Uniform 1987, Washington D.C., 22 Jan. 1987,  
"MINIX - A Cheap UNIX Clone with Source Code."
7. Second European SIGOPS Workshop on Distributed Systems, ACM, Amsterdam, 8 Sept. 1986,  
"The Amoeba System."
8. Second European SIGOPS Workshop on Distributed Systems, ACM, Amsterdam, 9 Sept. 1986,  
"Protection in Amoeba."
9. Sixth Int'l Conf. on Distr. Comp. Syst., IEEE, Cambridge, MA, 22 May 1986,  
"Using Sparse Capabilities in a Distributed Operating System."
10. USENIX Conf., Toronto, Canada, 14 July 1983,  
"A UNIX Toolkit for Making Portable Compilers."
11. UNIX Conf., Toronto, Canada, 19 June 1979  
"The Vrije Universiteit Pascal System."
12. Workshop on Distributed Systems, Brown University, USA, 3 Aug. 1977  
"A Taxonomy of Distributed Systems."
13. Workshop on Distributed Systems, Brown University, USA, 4 Aug. 1977  
"An Interactive Distributed System."

## Colloquia

1. Polytechnic University of Romania, 9 May 2018,  
"Where Have We Been and Where Are We Going?"
2. University of Paris, Paris, France, 6 June 2014,  
"MINIX 3: A Highly Reliable Operating Systems."
3. Royal Holloway University of London, Egham, U.K., 20 Mar. 2014,  
"MINIX 3: A Highly Reliable Operating Systems."
4. University of Padua, Padua, 20 Nov. 2013,  
"Where Are We Going."
5. University of Groningen, 29 May 2012,  
"MINIX 3: A Highly Reliable Operating System."
6. Petru Maior University, Targu Mures, Romania, 7 Oct. 2011,  
"The Future of Computers"
7. University of Twente, 1 Jun 2010,  
"MINIX 3: A Highly Reliable Operating System."
8. University of Changsha, Changsha, China, 5 Nov 2009,  
"Ten Golden Rules for Teaching Computer Science."
9. University of Changsha, Changsha, China, 5 Nov 2009,  
"MINIX 3: A Highly Reliable Operating System."
10. Imperial College, London, 26 May 2009,  
"MINIX 3: A Highly Reliable Operating System."
11. KNAW, Amsterdam, 25 Feb 2008,  
"Research in Computer Systems."
12. Philips Research, Eindhoven, 23 Apr. 2007,  
"MINIX 3: A Highly Reliable Operating Systems."
13. Charles University, Prague, 26 Nov. 2007,  
"MINIX 3: A Highly Reliable Operating System."
14. Polytechnic University of Bucharest, Bucharest, Romania, 23 Nov. 2007,  
"MINIX 3: A Highly Reliable Operating System."
15. Jagiellonian University, Krakow, Poland, 22 Nov. 2007,  
"MINIX 3: A Highly Reliable Operating System."

16. Eotvos Lorand University, Budapest, Hungary, 21 Nov. 2007,  
"MINIX 3: A Highly Reliable Operating System."
17. University of Warsaw, Warsaw, Poland, 20 Nov. 2007,  
"MINIX 3: A Highly Reliable Operating System."
18. University of Twente, Twente, The Netherlands, 10 May 2006,  
"MINIX 3: A Highly Reliable Operating System."
19. University of Toronto, 29 March 2006,  
"MINIX 3: A Highly Reliable Operating System."
20. University of Waterloo, Waterloo, Canada, 28 March 2006,  
"MINIX 3: A Highly Reliable Operating System."
21. TU Dresden, Dresden, 23 May 2005,  
"The Design of a Billion User Distributed System."
22. IIT Delhi, 23 Jan. 2004,  
MINIX 3: A Highly Reliable Operating System.
23. IIT Bombay, 21 Jan. 2004,  
MINIX 3: A Highly Reliable Operating System.
24. Anna University, Madras, India, 20 Jan. 2004,  
MINIX 3: A Highly Reliable Operating System.
25. IIT Madras, 19 Jan. 2004,  
MINIX 3: A Highly Reliable Operating System.
26. IBM T.J. Watson Research Lab. Hawthorne, NY, 6 Jan. 2003,  
"The Design of a Billion User Distributed System."
27. University of Oslo, Norway, 25 Oct. 2002,  
"The Design of a Billion User Distributed System."
28. Kon. Ned. Acad. van Wetenschappen, 27 Nov. 2000,  
"The Design of a Billion User Distributed System"
29. University of Colorado at Boulder, 19 Oct. 1998,  
"The Design of a Billion User Distributed System"
30. Bell Labs, Murray Hill, NJ, 22 Oct. 1998,  
"The Design of a Billion User Distributed System"

31. Sun Microsystems, Chelmsford, MA, 17 Oct. 1997,  
"The Globe Distributed System"
32. University of Wisconsin, Madison, WI, 15 Oct. 1997,  
"The Globe Distributed System"
33. Philips Nat Lab, Eindhoven, 20 Nov. 1996,  
"The Globe Distributed System"
34. CERN Summer School, Egmont aan Zee, 12 Sept. 1996,  
"Distributed Operating Systems"
35. CERN Summer School, Egmont aan Zee, 13 Sept. 1996,  
"The Amoeba Distributed Operating System"
36. CERN Summer School, Egmont aan Zee, 13 Sept. 1996,  
"The Globe Distributed System"
37. Friedrich Alexander University, Erlangen, Germany, 26 Feb 1996,  
"Parallel Programming Using the Amoeba Distributed System"
38. University of Colorado, Boulder, CO, 7 Dec. 1995,  
"Parallel Programming Using the Amoeba Distributed Systems"
39. University of Minnesota, Minneapolis, MN, 4 June 1995,  
"Parallel Programming Using the Amoeba Distributed Systems"
40. University of British Columbia, Vancouver, Canada, 29 May 1995,  
"Parallel Programming Using the Amoeba Distributed Systems"
41. Royal Dutch Academy of Arts and Sciences, Amsterdam, 30 January 1995,  
"Research Issues in Parallel and Distributed Systems"
42. University of California, Santa Cruz, CA, 18 Nov. 1994,  
"Parallel Programming Using the Amoeba Distributed System."
43. University of California, Santa Barbara, CA, 21 Nov. 1994,  
"Parallel Programming Using the Amoeba Distributed System."
44. New York University, 3 Dec, 1993,  
"Parallel Programming Using the Amoeba Distributed System."
45. Bell Laboratories, 13 Dec. 1993,  
"Parallel Programming Using the Amoeba Distributed System."

46. Cray Research, 18 Oct. 1991,  
"Amoeba and its Applications."
47. Sony Computer Science Laboratory, Tokyo, 17 Jan. 1991,  
"The Amoeba Distributed Operating System."
48. Keio University, Tokyo, 18 Jan. 1991,  
"The Amoeba Distributed Operating System."
49. IBM Japan, Tokyo, 18 Jan. 1991,  
"The Amoeba Distributed Operating System."
50. Toshiba Corp., Tokyo, 21 Jan. 1991,  
"The Amoeba Distributed Operating System."
51. Sharp Corp., Tokyo, 17 Jan. 1991,  
"The Amoeba Distributed Operating System."
52. University of Toronto, 12 Dec. 1989,  
"A Progress Report on Amoeba."
53. University of Virginia at Charlottesville, 8 Dec. 1989,  
"A Progress Report on Amoeba."
54. Santa Clara Convention Center, 28 May 1987,  
"MINIX - A UNIX Clone for the IBM PC."
55. SUNY Stony Brook, 16 March 1987,  
"The Amoeba Distributed Operating System."
56. Yale University, 12 March 1987,  
"The Amoeba Distributed Operating System."
57. Georgia Institute of Technology, Atlanta, Ga., 10 March 1987,  
"Reliability in the Amoeba Operating Systems."
58. Stanford University, Palo Alto, 27 Jan. 1987,  
"A Status Report on the Amoeba Distributed Operating System."
59. DEC Systems Research Lab, Palo Alto, 26 Jan. 1987,  
"A Status Report on the Amoeba Distributed Operating System."
60. M.I.T., Cambridge, MA 19 May 1986,  
"An Overview of the Amoeba Distributed System."

61. University of Wisconsin, Madison, WI, 16 May 1986,  
"Protection in the Amoeba System."
62. Course on Cryptography, CWI, 24 October 1985,  
"Cryptographic Protection in Distributed Operating Systems."
63. Logica, Rotterdam, 9 May 1985,  
"The Design of Portable Compilers."
64. CERN, Geneva, 17 Apr. 1985,  
"The Design of a Distributed Operating System."
65. CERN, Geneva, 17 Apr. 1985,  
"Current Research in Distributed Operating Systems."
66. University of Sydney, 14 Feb. 1985,  
"The Design of a Distributed Operating System."
67. University of New South Wales, Sydney, 13 Feb. 1985,  
"The Design of a Distributed Operating System."
68. University of Adelaide, 11 Feb. 1985,  
"The Design of a Distributed Operating System."
69. Monash University, Melbourne, 5 Feb 1985,  
"The Design of a Distributed Operating System."
70. University of Melbourne, 4 Feb. 1985,  
"The Design of a Distributed Operating System."
71. University of Essex, Colchester, 7 Sept. 1984,  
"Research in Distributed Operating Systems."
72. GMD, Bonn, Germany, 26 June 1984,  
"The Design of a Capability-Based Distributed Operating System."
73. University of Karlsruhe, Karlsruhe, W. Germany, 25 June 1984,  
"The Design of a Capability-Based Distributed Operating System."
74. University of Washington, Seattle, WA., 24 May 1984,  
"The Design of a Capability-Based Distributed Operating System."
75. Stanford University, Palo Alto, CA, 22 May 1984,  
"The Design of a Capability-Based Distributed Operating System."



76. University of Calif, Berkeley, CA, 21 May 1984,  
"The Design of a Capability-Based Distributed Operating System."
77. UCLA, Los Angeles, CA, 11 May 1984,  
"The Design of a Capability-Based Distributed Operating System."
78. Rijksuniversiteit Utrecht, 10 Nov. 1983,  
"Aspects of a Distributed Operating System"
79. IBM Research Center, Yorktown Heights, N.Y., 26 Aug. 1983,  
"The Amsterdam Compiler Kit."
80. IBM Research Center, Yorktown Heights, N.Y., 26 Aug. 1983,  
"A Capability-Based Distributed Operating System."
81. Bell Labs, Indian Hill, IL, 24 Aug. 1983,  
"A Real-Time Operating System and its Applications."
82. Bell Labs, Murray Hill, NJ, 28 July 1983,  
"MONIX- A UNIX-like Operating System."
83. Bell Labs, Murray Hill, NJ, 26 July 1983,  
"A Toolkit for Producing Portable Compilers."
84. Bell Labs, Murray Hill, NJ, 19 July 1983,  
"A Capability-Based Distributed Operating System."
85. IBM Europe Institute, Grassau, Germany, 13 June 1983,  
"Computer Network Protocols (series of 5 talks)."
86. IBM Europe Institute, Grassau, Germany, 14 June 1983,  
"Protection in Computer Networks."
87. IBM Europe Institute, Grassau, Germany, 14 June 1983,  
"Research Topics in Distributed Operating Systems."
88. B.S.O., Utrecht, 19 May 1983,  
"The Amsterdam Compiler Kit."
89. IBM Scientific Center, Heidelberg, 7 May 1983,  
"Design of a Capability-Based Operating System."
90. Technical University, Berlin, 18 Nov. 1982,  
"Code Generation and Optimization in a Portable Compiler System."

91. Queen Mary College, University of London, 10 Sept. 1982,  
"Design Principles of the MONIX System."
92. University of Saarbruecken, 28 May 1982,  
"Protection in a Distributed Operating System."
93. Katholieke Universiteit, Nijmegen, 11 Dec 1981,  
"Amoeba - A Distributed Operating System."
94. B.S.O., Utrecht, 24 Nov. 1981,  
"The Amoeba Distributed Operating System."
95. Technical University, Berlin, 5 Nov. 1981,  
"A Tool Kit for Making Portable Compilers"
96. General Electric, Schenectady, N.Y., 24 Aug. 1981,  
"The Amsterdam Compiler Kit."
97. University of Copenhagen, 26 June 1981,  
"Amoeba - A Distributed Operating System."
98. University of Copenhagen, 25 June 1981,  
"The Amsterdam Compiler Kit"
99. University of York, 14 May 1981,  
"The Amsterdam Compiler Kit."
100. University of Amsterdam, 10 Feb. 1981,  
"The V.U. Portable Compiler Project."
101. Bell Labs, Holmdel, NJ, 26 Aug. 1980,  
"Amoeba - A Distributed Operating System."
102. Bell Labs, Murray Hill, NJ, 12 Aug. 1980,  
"Amoeba - A Distributed Operating System."
103. University of Utrecht, 12 March 1980,  
"The UNIX Operating System."
104. Queen Mary College, University of London, 25 Jan. 1980,  
"The Vrije Universiteit Distributed System."
105. University of Nottingham, U.K, 23 Jan. 1980,  
"Local Networks."

106. University of Nottingham, U.K., 23 Jan. 1980,  
"The Vrije Universiteit Distributed System."
107. Vrije Universiteit, 10 Oct. 1979,  
"Samen Leven met de Chips."
108. Bell Labs, Holmdel, NJ 1 Aug. 1979,  
"Communication Architecture for a Microprocessor Network."
109. Bell Labs, Piscataway, NJ USA, 27 July 1979,  
"Distributed Computer Systems."
110. Bell Labs, Murray Hill, NJ 24 June 1979,  
"Communication Architecture for a Microprocessor Network."
111. University of Utrecht, 11 May 1979,  
"Network Protocols."
112. Case Western Reserve University, USA, 22 Jan 1979,  
"An UNCOL for a Microcomputer Network."
113. University of Guelph, Ontario, Canada, 18 Jan. 1979,  
"A Distibuted Interactive Computer System."
114. Canadian Information Processing Society, Kitchener, Ontario, Canada, 9 Jan 1979,  
"Network Standards."
115. University of Essex, U.K., 25 Sept. 1978,  
"A Pascal Compiler for UNIX."
116. Texas Instruments, Dallas, Texas, USA, 6 July 1978,  
"A High Level Machine Architecture."
117. Bell Labs, Murray Hill, NJ, USA, 30 June 1978,  
"A High Level Machine Architecture."
118. Katholieke Universiteit, Nijmegen, 6 June 1978,  
"A High Level Language Machine Architecture."
119. Vrije Universiteit, Amsterdam, 11 April 1978,  
"A UNIX Network."
120. Technische Hogeschool, Eindhoven, 14 Nov. 1977,  
"A Machine Architecture for Structured Programing."

121. Katholieke Universiteit, Nijmegen, 10 May 1977,  
"A Distributed Time Sharing System."
122. Katholieke Universiteit, Leuven, Belgium, 17 Nov. 1976,  
"A Distributed Time Sharing System."
123. Rijksuniversiteit, Utrecht, 11 Nov. 1976,  
"A Distributed Time Sharing System."
124. Mathematisch Centrum, Amsterdam, 19 Sept. 1975,  
"A Survey of Operating Systems."
125. Mathematisch Centrum, Amsterdam, 18 April 1975,  
"Programming Languages and Hardware."
126. Katholieke Universiteit, Nijmegen, 6 March 1975,  
"A Hybrid Time Sharing System."

### **Selected Panel Memberships**

1. USENIX, Boston, June 2006.
2. WIESS, San Diego, 22 Oct 2000.
3. Operating Systems Design and Implementation, San Diego, 23 Oct 2000.
4. Seventh ACM SIGOPS European Workshop, Connemara, Ireland, 9 Sept. 1996.
5. 15th Symposium on Operating System Principles, Copper Mountain, CO, 5 Dec. 1995.
6. 15th ICDCS, Vancouver, 2 June 1995.
7. NLUUG Spring Conf., Ede-Wageningen, The Netherlands, 12 April 1994.
8. Operating Systems Design and Implementation Conf., Monterey, CA, 1994.
9. Symposium on Operating System Principles, Asheville, NC, 1993.

### **Books**

I have written five books, each of which has gone through between three and six editions, depending on when the book was first published. The books have been translated into 21 languages and are used at universities all over the world. In all, there are currently 177 versions of these books. A list of them can be found at <http://www.cs.vu.nl/~ast/publications>. The total number of books sold is well into the

millions and has thus influenced the lives of millions of students.

## **MINIX**

I designed and implemented MINIX all by myself in 1985 in order to give students an open-source UNIX clone to study. I also wrote a book describing how it works inside, line by line. The software and the book became instant successes. The book has sold over 300,000 copies. In 2004 I became an Academy Professor of the Royal Netherlands Academy of Arts and Sciences, which provided me with 2 million euro for research. This led to a change of direction for MINIX, with MINIX 3 focusing on becoming a self-healing, fault-tolerant system targeted at embedded systems. This research led to my getting a prestigious ERC Advanced Grant in 2008 worth 2.5 million euro. In 2013 I received an ERC Proof of Concept grant to further develop MINIX 3.

In 2005 a new Website was set up for MINIX 3 and in 2007 we began tracking the traffic. Since 2007 there have been over 3 million visits to the Website and over 600,000 downloads of MINIX 3. As academic research projects carried out by a small team of Ph.D. students, this is quite a bit.

One of the early users of MINIX was Linus Torvalds. He began modifying MINIX to add new features that he thought were needed. Over a period of time he had modified almost everything and launched it as a new operating system, Linux. It is fairly safe to say that had I not written MINIX there would have been no Linux.

## Grants and Contracts

Some of the grants directly paid the salaries for Ph.D. students and postdocs with no cash involved. Others were expressed in euros or guilders. Some included both, as indicated below.

Year	Sponsor	Title	Man-yrs	Cash
2013	ERC	ERC Proof of Concept grant		EUR 150,000
2008	ERC	ERC Advanced grant		EUR 2,500,000
2005	KNAW	Academy professor		EUR 2,000,000
2003	NWO	A Small Secure Operating System	4	
2003	NWO	Security in Ubiquitous Computing Systems	4	
2001	NLNET	Globe Distributed Network 2		fl. 315,000
2001	NWO	Distributed ASCI Supercomputer 2		fl. 1,600,000
2000	NLNET	Globe Distributed Network 1		fl. 150,000
1999	Oce	Global Hot Potatoes 2		fl. 150,000
1999	NLNET	Globe		fl. 150,000
1998	STW	Electronic Sale of Electronic Information	6	
1998	Oce	Global Hot Potatoes 1		fl. 150,000
1998	NWO	Scalable Objects on the Information Superhighway	3	
1997	NEC	Implementing Java on Paramecium		\$35,000
1997	KPN	Advanced Web Servers	4	
1996	NWO	Locating Objects in a Worldwide Distributed System	4	
1996	NWO	Distributed ASCI Supercomputer		fl. 810,000
1995	EC	Distributed Systems Based on Shared Objects		ECU 35,000
1994	EC	A Parallel Application Test Suite		ECU 26,000
1993	EC	Software for Distr. and Parallel Computers		ECU 35,000
1993	NWO	Stimulans grant for ASCI		fl. 1,000,000
1992	NWO	Wide-Area Computing Based on Shared Objects	4	
1992	NWO	Research equipment for Amoeba		fl. 250,000
1990	NFI	Location-independent computing	1	fl. 3,000
1989	OSF	Research on Amoeba		\$100,000
1989	NFI	Research on Shared Memory Distr. Computing	1	fl. 3,000
1989	NWO	Starfish project	4	
1986	STW	Modula 2 compiler	4	fl. 5,000
1985	ZWO	System programming for 5th Gen. Computer Systems	8	fl. 730,000
1985	ESPRIT	Project 1032 European Research Workstation	2	ECU 3,000
1984	COST-11	MANDIS- Distributed Systems Management		ECU 8,000
1983	Philips	Amsterdam Compiler Kit		fl. 400,000
1981	STW	A Global Optimizer for the Amsterdam Compiler Kit	3	
1982	VU BRO	Research on Portable Microcomputer Operating Sys.	2	
1980	VU BRO	Research on Machine-independent Software	2	

Various grants were made jointly with colleagues of mine.