

- **Education**

- PhD, Electrical Engineering, **Columbia University**, New York, NY. Sep. 1994 to May 1999. Distinction. Thesis: *Market Mechanisms for Network Resource Sharing*
Eliahu I. Jury Award.
Advisor: A. A. Lazar
- M. Eng., EE, **McGill University**, Montréal, Canada. Sep. 1991 to Apr. 1993.
Project: *Model Matching Control*
Advisor: G. Zames
- B. Eng., Honours in EE, minor in Math, **McGill University**. Sep. 1987 to Dec. 1990.
Distinction (cum laude). University Scholar.

- **Journal Publications**

- N. Semret, R. F. Liao, A. Campbell and A. A. Lazar, **Pricing, Provisioning and Peering: Dynamic Markets for Differentiated Internet Services and Implications for Network Interconnections**, submitted to *IEEE Journal on Selected Areas in Communications*, Special Issue on Internet Quality of Service.
- A. A. Lazar and N. Semret, **Design and Analysis of the Progressive Second Price Auction for Network Bandwidth Sharing**, to appear in *Telecommunications Systems*, Special Issue on Network Economics.
- P. R. Jelenkovic, A. A. Lazar, and N. Semret, **The Effect of Multiple Time Scales and Subexponentiality of MPEG Video Streams on Queueing Behavior**, *IEEE Journal on Selected Areas in Communications*, Vol. 15, No. 6, August 1997.

- **Conference Publications**

- N. Semret, R. F. Liao, A. Campbell and A. A. Lazar, **Peering and Provisioning of Differentiated Internet Services**, *IEEE Infocom 2000*, Tel-Aviv, Israel, March 2000.
- N. Semret, R. F. Liao, A. Campbell and A. A. Lazar, **Market-Pricing of Differentiated Internet Services**, *IEEE-IFIP IWQoS '99*, London, UK, June 1999.
- A. A. Lazar and N. Semret, **Spot and Derivative Markets in Admission Control – Part I: reservations**, *16th Intl. Teletraffic Conf.*, Edinburgh, UK, June 1999.
- A. A. Lazar and N. Semret, **The Progressive Second Price Auction Mechanism for Network Resource Sharing**, *8th International Symposium on Dynamic Games and Applications*, Maastricht, The Netherlands, July 1998.
- P. R. Jelenkovic, A. A. Lazar and N. Semret, **Multiple Time Scales and Subexponentiality in MPEG Video Streams**, in L. Mason and A. Casaca, editors, *Broadband Communications*, Chapman and Hall, 1996.

- **Patents**

- “System and Method for Performing a Progressive Second Price Auction”, pending.
- “Hold Option for Advance Resource Reservation”, pending.

- **Teaching**

- Asst. Professor, **Univ. of California, Los Angeles**, Electrical Engineering, fall 1999.
- Course Manager, **Columbia University**, Summer 1998
Formulated, supervised, and graded project, mid-term, and final exam for *Resource Allocation and Networking Games*. Designed, implemented and conducted a distributed Java auction tournament with strategies submitted by students.
- Teaching Assistant, **Columbia University**. *Resource Allocation and Networking Games*, spring 97; *Multimedia Networking*, spring 96.
- Teaching Assistant, **McGill University**, EE and Math Depts., 1989-1993.
Graduate course in *Non-linear Systems*, undergraduate courses in *Advanced Calculus* and *Ordinary Differential Equations*.

• Industry Experience

- Co-founder, Invisible Hand Networks, Inc., since November 1997.
- Summer Research Position, Internet Architecture Lab, **Bellcore**, Morristown, NJ. May-August 1997. Supervisor: C. Huitema
- Member of Technical Staff (summer internship), **Bell Labs**, Lucent Technologies, Holmdel, NJ. May-August 1996. Supervisor: S. Ahuja
Developed **MREX** (see software). Developed **Waga**, a prototype agent based web-resource load balancing and pricing system.
- Consultant, Pan-African Development Information Systems, **United Nations ECA**, Addis Abeba, Ethiopia. June-July 1995.
- Research Engineer, **INRS-Telecom**, Montréal. Oct. 1993-Aug. 94.
- Intern, **International Telecommunications Satellite Organization** (INTELSAT), Washington, DC. May-September 1993.
- Research Assistant, **National Research Council**, Dominion Radio Astrophysical Laboratory, Penticton, BC. May-August 1990.
- Research Assistant, **McGill Research Center for Intelligent Machines**. May-August 1989, June-August 1988.

• Awards

- E. I. Jury Award, Department of Electrical Engineering, Columbia University, 1999 (given to one PhD dissertation each year).
- Co-winner, Best TA award, Columbia Video Network, Spring 1996.
- Author of TREX – Top 10 Web Applet worldwide, December 1995 & February 1996 (Java Applet Rating Service); applet appears in several books and CD-ROMs on Java programming.
- Natural Sciences and Engineering Research Council of Canada (NSERC), Post Graduate Scholarship, 1991/92 and 92/93.

- NSERC, Summer Undergraduate Research Award, 1989 and 1990.
- *Faculty Scholar* designation, McGill University, 1988/89 and 1989/90.
- Offered admission to the Massachusetts Institute of Technology, class of 1991.
- Concours National de l'Association Mathématique du Québec, (collegiate level math contest), 7th prize, 1987.

- **Languages**

- Computer: Java, C++, C, FORTRAN, Pascal, BASIC; strong experience with UNIX , MS-Windows and MS-DOS operating systems, have worked in VMS (VAX).
- Human: fluent in French, English and Amharic; quasi-fluent in Spanish; have studied German, Arabic, and basic Swahili.

- **Interests**

- Board member and webmaster of the *Ethiopian Scientific Society*.
- Creator of the *Ethiopian Internet White Pages*.
- Amateur investor; implemented own portfolio balancing algorithm based on stochastic optimization theory.
- Traveled to more than 40 countries on 5 continents.
- Participated in (and finished) a Triathlon.
- I enjoy literature, music and history and try to keep abreast of current events. I have occasionally written for the *McGill Daily*.

- **Other Biographical Data**

- Born: January 14th, 1970, Addis Abeba, Ethiopia
- Citizenships: Ethiopian, Canadian

- **References**

- A. A. Lazar, Dept. of Electrical Engineering, Columbia University (aurel@comet.columbia.edu)
- C. Huitema, Internet Architecture Lab, Bellcore (huitema@bellcore.com)
- S. Ahuja, Bell Labs, Lucent Technologies (sra@dnrc.bell-labs.com)
- E. Noam, Columbia Insitute for Tele-Information (elinoam@claven.gsb.columbia.edu)