Lev Muchnik

PERSONAL

Date of birth: 30/07/1973
Family status: Married + 2

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EDUCATION

2003-Present   Ph.D. studies, Department of Physics, the Bar Ilan University (Israel) under supervision of Prof. Havlin and Prof. Louzoun.

1997-2003   Studies towards M.Sc. in physics in the Hebrew University of Jerusalem. Suspended the studies in 1999 due to my work in TopSpin Medical.

1994-1997   Studies for B.Sc. in physics in the Hebrew University of Jerusalem. Was awarded a yearly Rector Award. Graduated with excellence.

RESEARCH INTERESTS

My research is focused on empirical analysis and theory of complex networks including definition of methodology of dynamically evolving networks, understanding of general network properties, dynamics of network evolution and function, and application of the research methods to the real world networks.

Beyond networks, my research interests include other domains of the Complexity Science. I'm interested in modeling of dynamical systems, agent-based simulations, extreme events statistics and Econophysics.

PROFESSIONAL EXPERIENCE

2003-Present - TopSpin Medical (Israel) Ltd .
Consultant on MRI technology, MRI-related signal analysis, algorithms and system design and implementation, signal and image processing. Numerical simulation of experiment setups. Design and construction of measurement apparatus – mainly MRI spectrometer and mapping systems.

1999-2003 – TopSpin Medical (Israel) Ltd.
Head of Software and Simulations Department and senior scientist in a company developing an innovative imaging technology based on Nuclear Magnetic Resonance (NMR). The main product is a measurement system and intravascular catheter capable to detect atherosclerosis symptoms in coronary arteries.

1997-1999 – ORT College
Teaching C++ and graduate projects guidance in the ORT College (for degree in practical engineer in programming).

DEVELOPMENT ENVIRONMENTS

I have designed, implemented and supervised systems of high complexity, involving components from embedded devices operating in real time and instrument control to high-volume signal acquisition and processing, databases, user interfaces, communication and general software frameworks. Such complex systems usually require careful design; their implementation involves combination of several development environments.

Program Languages and Technologies:

10 years of experience in every aspect of C++ and MatLab development. 5 years - C# and .NET. Routine work with WIN32 API, databases, application automation, networking. Acquaintance with WEB technologies, CMS.

LIST OF PUBLICATIONS

Muchnik, L., Bunde, A. & Havlin, S. (2007) *Long term memory in extreme returns of financial time series*. *submitted*

Royi Itzhack, Lev Muchnik, Tom Erez, Lea Tsaban, Jacob Goldenberg, Sorin Solomon and Yoram Louzoun (2007), *Diagonal attachment: The Quest for the Mechanism Underlying Network Evolution. submitted*

Lev Muchnik , Royi Itschak , Sorin Solomon and Yoram Louzoun (2007) Phys. Rev. E **76**, 016106, *Self-emergence of knowledge trees: Extraction of the Wikipedia hierarchies*

Louzoun, Y., Muchnik, L. & Solomon, S. (2006) Copying nodes vs. Editing links: the source of the difference between genetic networks and the WWW. . *Bioinformatics* **22,** 581-588.

Muchnik, L., Louzoun, Y. & Solomon, S. (2006) Agent Based Simulation Design Principles — Applications to Stock Market. *Practical Fruits of Econophysics. Proceedings of the Third Nikkei Econophysics Symposium*, 183-188

Muchnik, L. & Solomon, S. (2006) Markov Nets and the NatLab platform; Application to Continuous Double Auction. In *New Economic Windows*Springer-Verlag, Berlin.

Yamasaki, K., Muchnik, L., Havlin, S., Bunde, A. & Stanley, H. E. (2006) Scaling and Memory in Return Loss Intervals and Application to Risk Estimation. *Practical Fruits of Econophysics. Proceedings of the Third Nikkei Econophysics Symposium*, 43-51.

Daniel, G., Muchnik, L. & Solomon, S. (2006) Traders imprint themselves by adaptively updating their own avatar. In *Lecture Notes in Economics and Mathematical Systems: Artificial Economics, Agent-Based Methods in Finance, Game Theory and Their Applications*, Vol. 564 (Ed, P. Mathieu, B. B. a. O. B.) Springer pp. 27-38

Yamasaki, K., Muchnik, L., Havlin, S., Bunde, A. & Stanley, H. E. (2005) Scaling and memory in volatility return intervals in financial markets. *PNAS,* **102,** 9424-9428

Blank, A., Alexandrowicz, G., Muchnik, L., Tidhar, G., Schneiderman, J., Virmani, R. & Golan, E. (2004) Miniature self-contained intravascular magnetic resonance (IVMI) probe for clinica applications. *Magnetic Resonance in Medicine,* **54,** 105-112

Jacob Schneiderman, Wilensky, R. L., Weiss, A., Samouha, E., Muchnik, L., Chen-Zion, M., Ilovitch, M., Erez Golan, M., Blank, A., Flugelman, M., Rozenman, Y. & Virmani, R. (2004) Diagnosis of Thin-Cap Fibroatheromas by a Self-Contained Intravascular Magnetic Resonance Imaging Probe in Ex Vivo Human Aortas and In Situ Coronary Arteries. *Journal of the American College of Cardiology,* **45,** 1961-1969

Muchnik, L., Slanina, F. & Solomon, S. (2003) The interacting gaps model: reconciling theoretical and numerical approaches to limit-order models. *Physica A,* **330,** 232-239

Muchnik, L. & Solomon, S. (2003) Statistical Mechanics of Conventional Traders May Lead to Non-Conventional Market Behavior. *Phys. Scr.,* **106,** 41-47

Muchnik, L. (2003) Simulating emergence and complex collective dy namics in the stock markets. Master's thesis, Israel, 2003. Available at http://www.complexity-research.org/natlab . In *Department of Physics*, Vol. Masters The Hebrew University of Jerusalem, Israel, pp. 200.

PRESS RELEASES ON MY RESEARCH

- Philip Ball, Stock Market Shock Explained, Nature, October 1, 2002. http://www.nature.com/nsu/020923/020923-18.html
- Mark Frauenfelder, How Wall Street Is Like a Guitar String, Business 2.0,. March 2003, http://www.business2.com/articles/mag/0,1640,47145,00.html

SELECTED TALKS

- Realistic Platform for Modeling, Experimentation and Simulation in Economics ". Practical Fruits of Econophysics", Nikkei Econophysics III, November 2004
- Realistic Simulation Applied to Stock Market. "The Emergence of Identity and Self Organization in Social Systems"

REFERENCES

- Prof. Yoram Louzoun, louzouy@macs.biu.ac.il
- Prof. Sorin Solomon, sorin@cc.huji.ac.il
- Prof. Armin Bunde, Armin.Bunde@theo.physik.uni-giessen.de

LANGUAGES

Hebrew, English, Russian.