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Márk Horváth

Education

- **2008 – Budapest University of Technology and Economics (BME)**
  - Ph.D. student at Department of Stochastics
- **2004 – 2005 Vrije Universiteit Amsterdam**
  - M.Sc. in Artificial Intelligence
- **1999 – 2005 Eötvös Loránd University Budapest**
  - Computer Science studies
  - Specializations in Artificial Intelligence, Economics, Operation Research, Numerical Methods

Teaching

- Basic probability courses (200 students)
- Statistics
- Seminar on Machine Learning
- Formal program verification

Publications

- **Growth optimal investment**
  - Horváth, M., *Log-optimal Portfolio Selection with Short Selling and Leverage*, submitted to ALT 2009
- **Reinforcement Learning and Evolutionary Algorithms**
  - Eiben, A. E., Horváth, M., Kowalczyk, W., Schut, M.C., *Reinforcement Learning for Online Control of Evolutionary Algorithms*, Lecture Notes in Computer Science, Volume 4335, 151-160, 2007, Springer.
  - Rick, T., Horváth, M., Bercsey, T., *Design Task Scheduling Using Genetic Algorithms*, Periodica Politechnica. Ser. Mech. Eng., 50/1, 37-51, 2006.
  - Horváth, M., *Controlling Evolutionary Algorithm Parameters through Reinforcement Learning*, Master's Thesis, Vrije Universiteit, Amsterdam, 2005.
- **Structures of maximal complexity**
  - Horváth, M., Iványi, A., *Growing perfect cubes*, Discrete Mathematics, 2007, In Press
  - Horváth, M., Iványi, A., *Perfect Sequences,* International Conference of Applied Informatics, Eger, 2004

Areas of Interest

- **Finance**
  - Growth optimal investment
  - Statistical arbitrage
- **Mathematics**
  - Non-parametric statistics
  - Algorithmic complexity
- **Machine Learning**
  - Hybrid, self-adaptive algorithms
- **Programming**
  - Functional programming languages

Computer Skills

- Started programming as a child
- Languages: Java, C#, C++, MATLAB, VBA, Delphi, …
- Statistical and data discovery software: Weka, SPSS, R, SAS
- Operating systems: Linux (administrator level), Windows

Language Skills

- Hungarian (native)
- English (fluent)
- German (medium)
- Spanish (basic)

Professional Experience

- **2006 – 2008 Morgan Stanley – Analytic Modeling Centre**
  - **Quantitative analyst (2007−2008)**
    - Design and implementation of statistical arbitrage algorithms for fixed income
      - Implementation of intraday trading simulation and execution environments with trading algorithms (Java, MATLAB, C#)
      - Kernel and histogram based density estimation
      - Long-short portfolios
      - Evolutionary optimization of experts for market prediction (MATLAB)
    - Historical and risk-neutral pricing of illiquid mortgage backed securities
    - Behavior prediction of mortgage borrowers (Weka, MATLAB, SAS)
    - Parameter identification using Kalman filter, Expectation Maximization (R)
  - **IT (2006)**
    - Development of risk management tools
    - Mark-to-market calculations for fixed income securities
    - Massively parallel processing with distributed memory
    - Java (Eclipse), C#, A+, XML, SOAP, SQL, Tangosol
- **2005 – 2006 Freelance**
  - OpenGL/DirectX 3D programming (C++)
- **2002 – 2003 Astron Informatics Ltd.**
  - Scoring and accounting system of electronic power consumption for MVM Rt.
  - Oracle, PL/SQL , HTML, Java Script
- **2000 – 2002 Freelance**
  - Web-portal development in PHP, Java Script
  - Applications in Visual C++ (MFC), Java and VBA