# Pavel Levin, Ph.D.

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**Summary:** Machine Learning models in Finance, Materials Science, Sustainability systems; Reaction-, drift-diffusion; Data Science, Data Analysis, Data Modeling for industrial applications; Applying Statistics; Modeling/optimization of technological processes;Agile product development from MVP.

**Professional Experience:**

2009-pres Vaposun Inc., *Brooklyn, NY* – Project Lead/Data Scientist/Research Analyst/Consulting: *Utilizing Agile Product Development, Data Science, Statistics/Multivariate Data Analysis, AI/DL, Python 3/Pandas/Tensorflow/Scikit-learn/Matplotlib, SQL server/ DB architecture/Azure, VS2017/C#, VBA/Excel, PyTorch, Apache Spark, NoSQL, etc. for Innovation and System optimization projects, such as: Mobile/IoT/V2V network configuration optimization for preventing man-in-the-middle attack (2 patents, statistical model and RDB schema developed); Neural network application to financial transactions: deep learning models with Adam optimizer;* *Ensembles Learning; LLM, RAG, Hyper-parameter tuning; Model pipeline; RDBMS: logical and physical data modeling - entities, attributes, relationships and keys for the conceptual models; People research: matching project and innovator (Natural language processing algorithms); Smart home solar management system with open-loop solar radiation collection system and PV cell cooling regime optimization; Hadoop, Databricks, Neo4j; Azure Databricks ML Flow; Advanced Analytics (MS Power BI, text analytics, visualization), Energy market solutions; Direct methanol fuel cells – efficiency (thermal model and patent proposal); Magnetic neural stimulation, Drift-diffusion MRI (Motion compensation (statistical methods, data modeling, patent and proposal). Mentoring – PowerBridgeNY: Thermal energy storage technology for buildings – statistical modeling. MVP creation, commercialization preparation.* *(Startup – see Patent list: Oct 2010 – present. Some clients: H&C Scientific Resources International, Longmont, CO, Xinova LLC., Seattle,WA, Solar thermal project: May 2011-Dec 2017; MSV Associates, Fair Lawn, NJ: Jan 2009-Dec 2014; Sanova Inc., Queens, NY: Jan2010 – June 2010; Scenar, MRI project: Oct 2015- Dec 2018; Utilisave, NYC: Jan2019-June 2019; CHD AI LLC, NYC: July 2019-Dec 2019; P2P payment platform project Jan 2020- pres.).*

2018-pres St. John’s University, Mathematics & Computer Sciences Department – Adjunct Assoc. Professor: *Teaching Biostatistics. Research -Financial applications (Options, bonds, CDS, equity future pricing and Risk modelling): Deep Learning model; Statistical Applications, Calculus- BlackBoard/Canvas Analytics Platform-based courses. Infectious disease spread modeling; Python 3, VBA/Excel. Reviewer for SAJSS Economics, ARJoMath: Comparative Modelling of Price Volatility in Nigerian Crude Oil Markets using Symmetric and Asymmetric GARCH models. (See Courses taught).*

2021-2023 TCS – Lead Data Science, TTH: *Utilizing GCP VertexAI, BigQuery, MLOps for Agile Product Development; NLP: LLM, hyperparameters, gensim, Transformers, BERT, Hugging Face, Jira; Collating universal catalog, Recommender systems: Item Embedding, Buy It Again (Python, BigQuery), Recommended For You (weighted\_rating, truncated SVD/sklearn, LSTM), Frequently Bought Together (cosine\_similarity, Neural Collaborative Filtering/keras); Recommender AI/Google Retail/GCP; Exploratory data analysis (Python, SQL BigQuery); PyTorch, PySpark, Snowflake, Databricks, ETL, Data Warehousing: Multi-linear regression, Time series forecasting for retail (ARIMA, XGBoost, LightGBM, NBEATS); Reinforcement Learning; Transcend Presales; Airline analytics (Clients: Delta, Ingram Micro: Aug 2021- Dec 2022, BestBuy, Lufthansa: Jan 2023-Oct 2023 ).*

2006-2008 St. John’s University, Physics Department; New York Institute of Technology, School of Management, *NYC* – Adjunct Assoc. Professor: *Research - Financial applications: stochastic differential equation, boundary conditions, jumps, fat tails, reduced logarithmic coordinates, catastrophe modeling. Spin transfer nanodevices - differential equation, spatio-temporal resonance structures; High-temperature diffusion processes - computer simulation; VBA/Excel, COMSOL Multiphysics. Reviewer for: “Intern Journal Heat Mass Transfer”, “Journal of Eng Mathematics”. (See Courses taught).*

2004-2005 Veeco Instruments Inc., *Plainview, NY* - Process Development Engineer: *Nanotechnology - Process development; Data storage nanodevices: experimental research, statistical modeling; High-vacuum equipment control, maintenance; Fabricating thin film hetero-structures; Thin film deposition optimization, characterization; Plume distribution modeling: Statistical methods, Multiple regression analysis, VB, AutoCAD.*

2002-2006 The City College/CUNY, Mechanical Engineering Dept., *NYC* - Adjunct Assoc. Professor, Adjunct Professor: *Courses, years – see below; Research - Thermal fields with moving source, phase-boundary: Temperature and stress analysis: C++, MatLab. (See Courses taught).*

**Education and Training:**

Postdoc: Ben-Gurion University of the Negev (BGU), *Beersheba, Israel*, Materials Eng. Dept.: *Thermal-diffusion* processes *with moving source.*

Ph.D.: Donetsk National Technical University (DNTU), *Donetsk, Ukraine*,Physical Metallurgy Dept.: *Materials Engineering; Mathematical modelling of Continuous casting, process optimization.*

B.S./M.S.: DNTU, *Donetsk, Ukraine*, Mechanical Engineering Dept.: *Mechanical Equipment in Metallurgy (GPA: 3.97, with Honors).*

**University Courses Taught:**

2018- Biostatistics, Applied Statistics, Calculus for Biological, Business Applications (SJU)

2007-2008 Conceptual Physics – Science Inquiry, Physics Labs (SJU)

2004, 2006 Advanced Strength of Materials; Experiment Design (CCNY)

2006-2007 Quantitative Analysis for Management (NYIT)

2002 Introduction to Engineering Analysis (*Advanced calculus for applications* - CCNY)

1997 “Foundations of Contemporary Business”, “Strength of Materials”; “Machine Design”, “Cargo Handling Equipment”, etc. (DNTU)

**Professional development:**

2020 Innovation Certification Program, Xinova cert.

2017-2020 Python for Data Science, Machine Learning Scientist Program, DataCamp cert.

2013 Data architecture & SQL, C#, Python programming - BZ, Cooper Union School of Engineering

2007-2008 T3 Technology seminar - St. John’s University:

2004 ASME’s seminar - The City College/CUNY, Mechanical Eng Dept.

1999-2000 C/C++, ANSYS/UNIX seminars - Ben-Gurion University of the Negev

1996 MBA courses - La Salle University, Pennsylvania University, SBA (*internship, Philadelphia, PA*)

1994-1995 Computer-programming, Pedagogical and psychological seminars - DNTU

**Languages:** English, Russian (*native*), Hebrew, Ukrainian

**Publications:** 22 articles in refereed journals, 13 - in Int. conf. proc., 21 published patents.

* + 1. A. *Selected scientific papers*

1. P.A. Levin, Analytical model for continuous caster profile optimization, *Ironmaking and Steelmaking,* 28 (4), 2001, pp.342-346.
2. P. Levin, N. Frage, Modeling of laser treatment based on an analytical solution for the steady state temperature distribution in a moving system, *Lasers in Engineering,* 11, 2001, pp. 47-55*.*
3. P. Levin, Quasi-steady-state modeling of dendritic growth, *Physics Letters A,* 310 (5-6), 2003, pp. 383-388.
4. P. Levin, Periodic structure of spin-transfer current in ferromagnetic multilayers, *Physics Letters A* 360 (3), 2007, pp. 467-471 ( <http://arxiv.org/ftp/nlin/papers/0606/0606064.pdf> ).
5. P. Levin, A general solution of 3D quasi-steady-state problem of a moving heat source on a semi-infinite solid, *Mechanics Research Communications* 35 (3), 2008, pp. 151-157.
6. P. Levin, A mirror-diffusion model of options pricing, *13th Annual Faculty Research Forum, St. John’s Univ., Queens, NY, 2008/04/08* (*available at arXiv:* <http://arxiv.org/ftp/arxiv/papers/0802/0802.3679.pdf> )*.*
7. P. Levin, Forward Backward Stochastic Model of Financial Asset Pricing with Idiosyncratic Noise, *Global Finance Conference, Braga, Portugal, 2022/06/20* (*Available at SSRN:* <https://ssrn.com/abstract=3858106>, 2021/06/01)*.*
8. P. Levin, Instantaneous and Averaged Volatility in Two-Side Filtration Model of Financial Asset Pricing, *Peter Carr Memorial Conference, NYU, New York, 2022/06/03*

### P. Levin, Instantaneous and Averaged Volatility in Two-Side Filtration Model of Financial Asset Pricing,

The Journal of Derivatives, 31 (1), Fall 2023, 49-63.

1. P. Levin, Reduced-Form Market Model of CDS Risk with Forward-Backward Enlargement,

(Available at SSRN: <https://ssrn.com/abstract=5342666> or [http://dx.doi.org/10.2139/ssrn.5342666](https://dx.doi.org/10.2139/ssrn.5342666) , 2025/07/17).

*B. Selected inventions and patents*

1. P. Levin, Solar radiation collection system and method, *Patent US 8,915,241, publ. 2014-12-23.*
2. P. Levin, Method and apparatus for magnetic resonance imaging, *Patent US 9,513,358 B2, publ. 2016-12-06; PCT Application US2014/023937.*
3. P. Levin, Device authentication in ad-hoc networks, *US Patent 9813406B2, publ. 2017-11-07.*
4. P. Levin, Method of electrostimulation, Patent disclosure *(2015/11/24).*
5. P. Levin, Method and system for network communication, *US Patent 10963870 B2, publ. 2021-03-30.*