Name: Gil Avrahami **Date:** 15/8/2023

CURRICULUM VITAE

1. Personal Details

Permanent Home Address: 2 Bialik Street, Rishon Le-Zion

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2. Higher Education

A. Undergraduate and Graduate Studies

Degree	Years	Department	Institution
M.Sc.	2002-2004	Information Systems Engineering	Ben-Gurion university
B.Sc.	1991-1995	Industrial Engineering & Management	Ben-Gurion university

B. Doctoral Degree and Post-Doctoral Studies

Degree	Years	Department	Institution
Post-doctoral	2023-today	Information Systems Engineering	Ben-Gurion university
Ph.D.	2017-2023	Information Systems Engineering	Ben-Gurion university

3. Academic Ranks and Tenure in Institutes of Higher Education

Dates	Institution and Department	Rank/Position
2022-today	The College of Management Academic Studies – Faculty of Business Management	Instructor
2017-today	Ben-Gurion university – Information Systems Engineering department	Instructor

4. Participation in Scholarly Conferences

Active Participation

Date	Name of Conference	Place	Subject of Lecture/Discussion	Role
6/8/2004	IMS 2004: 4th International Symposium on Intelligent Manufacturing Systems	Sakarya university, Turkey	An Innovative Method of Mining Traffic Data for Improving Control of an Urban Intersection	Lecturer

5. Research Grants

Grants Awarded

Role in Research	Co-Researchers	Topic	Funded by/Amount	Year
Ph.D. researcher	Prof. Mark Last	Artificial Intelligence System for Detection of GPS Spoofing Attacks	MAGNETON program in the Ministry of Innovation, Science and Technology	2019-2021

6. Scholarships, Awards and Prizes

Degree	Instructor	Scholarship	Funded by	Year
Ph.D.	Prof. Mark Last	Negev scholarship for HiTech Ph.D. students	Ben-Gurion university - Kreitman school	2017-2021

7. Teaching

A. **Courses Taught in Recent Years**

Year	Course Name	Type: Lecture/Seminar/Workshop/ High Learn Course/Introduction	Degree	No. of Students
2023-today	Software Project Management	Lecture – Ben Gurion university	B.Sc.	112
2023-today	Stochastic Processes in Operations Management	Lecture – Ben Gurion university	B.Sc.	95
2023-today	Databases	Lecture - The College of Management	B.A.	42
2023-today	Business Intelligence	Lecture - The College of Management	B.A.	48
2023	Big Data	Lecture - The College of Management	M.A.	67
2023-today	Business Data Analysis using SQL	Lecture - The College of Management	M.A.	64
2022-today	Data Warehouse and Business Intelligence	Lecture – Ben Gurion university	B.Sc.	95
2022-today	Data collection and management	Lecture – Ben Gurion university	B.Sc.	84
2019-today	Data Science	Lecture – Ben Gurion university	B.Sc.	143
2019-today	Introduction to Information Systems	Lecture – Ben Gurion university	B.Sc.	164
2018	Simulation	Lecture – Ben Gurion university	B.Sc.	81
2017	Advanced Programming	Lecture – Ben Gurion university	B.Sc.	154

B. **Supervision of Graduate Students** (Co-supervision)

Name of Student	Title of Thesis	Degree	Completion Date / in Progress	Students' Achievements

Assaf Magrisso	Detection of Cyber attacks on aerial vehicles	M.Sc.	December 2021	Development of innovative machine learning application
Assaf Fried	Detection of Cyber attacks on aerial vehicles	M.Sc.	July 2021	Development of innovative machine learning application

8. Professional Experience

Years	Company	Position
2017-2003	Point of View Software	CEO & Founder
2001-2002	ICQ (Mirabilis)	Business-Intelligence department manager
1999-2000	Applicad	ERP & Business-Intelligence projects manager
1996-1999	Israel Air Force	ERP & Business-Intelligence officer

PUBLICATIONS

A. Ph.D. Dissertation

Title of Ph.D. Thesis: Early Detection of GPS Spoofing Attacks on Aerial Vehicles using Machine Learning
Academic institution: Ben-Gurion University, Israel
Department: Information Systems Engineering
Name of Supervisor: Prof. Mark Last

B. Other Scientific Publications – PATENTS registered in the US:

Published

1. **Avrahami**, G., Zer S., Sagi E. (2013). "*Method for creating manipulating exchanging and distributing information messages of organized data structure*". US Patent 8,429,228. Citations: 10.
2. **Avrahami**, G., Sagi E., Zer S. (2007). "*Method for a dynamic information messaging system*". US Patent 7,225,195. Citations: 36.

C. Articles in Refereed Journals

1. Last, M., **Avrahami** G., Kandel A. (2011). "*Using Data Mining Techniques for Optimizing Traffic Signal Plans at an Urban Intersection*", International Journal of Intelligent Systems, Vol. 26, Issue 7, pp. 603–620. Citations: 12, Impact Factor: 7.
2. Cohen, L., **Avrahami** G., Last M., Kandel A., Kipersztok O. (2008). "*Real-Time Data Mining of Non-Stationary Data Streams from Sensor Networks*", Information Fusion, Special Issue on Distributed Sensor Networks, Vol. 9, Issue 3, pp. 344-353. Citations: 112, Impact Factor: 18.6.
3. Cohen, L., **Avrahami** G., Last M., Kandel A. (2008). "*Info-Fuzzy Algorithms for Mining Dynamic Data Streams*", Applied Soft Computing, Special Issue on Soft Computing for Dynamic Data Mining, Vol. 8, Issue 4, pp. 1283–1294. Citations: 70, Impact Factor: 8.7.

D. Articles in Conference Proceedings

1. Cohen, L., **Avrahami** G., Last M., Kandel A. (2006). "*Efficient Learning Algorithms for Agents Mining Time-Changing Data Streams*", Proceedings of the International Conference on Computational Intelligence for Modeling Control and Automation and International Conference on Intelligent Agents Web Technologies and International Commerce (CIMCA'06), pp. 257, Sydney, Australia, December 1st, Citations: 4.
2. Cohen, L., **Avrahami** G., Last M., Kandel A., Kipersztok O. (2005). "*Incremental Classification of Nonstationary Data Streams*", Proceedings of the Second International Workshop on Knowledge Discovery in Data Streams, pp. 117-124, October 7th, Porto, Portugal. Citations: 15.

3. Cohen, L., **Avrahami** G., Last M., Kandel A., Kipersztok O. (2005). "*Incremental Knowledge Discovery in Traffic Sensors Data*", In Proceedings of SENSORFUSION, Workshop on Information Fusion and Dissemination in Wireless Sensor Networks, Budapest, Hungary, July 14th.
4. Cohen, L., **Avrahami** G., Last M. (2004). "*Incremental Info-Fuzzy Algorithm for Real Time Data Mining of Non-Stationary Data Streams*", Proceedings of TDM 2004 - ICDM Workshop on Temporal Data Mining: Algorithms, Theory & Applications, November 4th, Brighton, UK. Citations: 28.
5. Kandel, A., Last M., **Avrahami** G. (2004). "*An Innovative Method of Mining Traffic Data for Improving Control of an Urban Intersection*", 4th International Symposium on Intelligent Manufacturing Systems, Sakarya, Turkey, pp. 32-41, September 8.

E. Submitted Publications

1. **Avrahami**, G., Last M., Magrisso A. (2023). "*Ensemble of univariate LSTM Encoder-Decoder Algorithms for Early Detection of Anomalous ADS-B Messages*", International Journal of Computers & Security. Impact Factor: 5.6

F. Summary of My Research Activities and Future Plans

Please note that I am the first author or the first co-author (equal contribution) in every publication listed above.

In my Ph.D. dissertation, we developed a prototype based on a machine-learning approach for building an activity profile of aircraft. Then we applied anomaly detection techniques to the aircraft's current activities to identify hacker attempts to manipulate the location and the route of the plane. Our approach enables early detection of GPS spoofing attacks based on unsupervised learning in real time over unexpected trajectory flight types and sophisticated hijacking techniques.

I am planning to continue my post-doctoral research at Ben-Gurion University, for the next two years. The research supervisor is Prof. Mark Last from the department of Information Systems Engineering.

In my Post-doctoral research, I plan to develop enhanced anomaly detection methodologies with supervised and unsupervised approaches to detect more sophisticated cyber-attacks on aerial vehicles, with various types of trajectories. My plan is to outperform existing state-of-the-art detection methods with a shorter detection duration and with higher detection accuracy.