

# Tamas Madl

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## Experience

- 2024  
2024
- Founder, LeadershipMaturity.ai**
- Platform for leader growth & development. Most accurate AI assessment, rivaling human experts, based on custom-trained LLMs (**outperforming ChatGPT & Claude by >30%**) & 100+ cognitive models.
- 2024  
2024
- Independent Researcher & Founder, NeuroKensho.ai**
- Novel EEG neurofeedback ML for flow & higher states of consciousness (**Nature Sci Reports**, in press)
- 2021  
2024
- Senior Healthcare Data Scientist, Public Sector Healthcare, Amazon Web Services**
- Led teams developing scalable solutions based on AI/ML to solve high-impact challenges in healthcare & life sciences, incl. multi-modal and genomic cancer classification (**industry-leading accuracy**), privacy-preserving data synthesis (**patent pending**), outcome prediction based on clinical notes w. transformers
  - Scientific work on leukemia diagnosis (Blood, '23), drug response prediction (ISCB, '21) & DP (AAAI, '22)
- 2019  
2020
- Technical BD Manager, Machine Learning/AI, Public Sector (PS), Amazon Web Services**
- Helped drive ML GTM to **207% YoY growth** & helped EMEA PS customers use AWS for AI/ML, through workshops (executive - e.g. increasing data team productivity - and technical, e.g. autoML, distributed ML), problem solving (e.g. architecture guidance) & PoC projects - **avg. \$2.1M annual revenue impact**
  - Led teams of data scientists, solution architects and consultants to deliver high-impact customer projects, incl. an ML-powered leukemia subtype diagnosis solution, leading to **largest ML opportunity in EMEA**
- 2018  
2019
- Senior Data Scientist, People Analytics, McKinsey & Company, Inc.**
- Predictive modelling and problem solving around leadership, strategy, decision making, and debiasing for large corporate clients with data science tools, based on a combination of structured, text, and image data.
  - Models built include recurrent neural nets reading doctor handwriting (**outperforming all products and APIs on the market**), Siamese nets for fraud detection, ensembles trading off accuracy & interpretability for stakeholders, **models to de-bias leaders** in collaboration with Nobel-prize winner Daniel Kahnemann
  - Supervised and mentored 2-4 data scientists on client projects; built capabilities in clients' data teams
- 2016  
2018
- Founder, HeartShield Ltd.**
- Developed HeartShield, an app providing early warning for heart disease risk on smartphones, using a **patent-pending deep learning model using spiking neurons** inspired by pacemaker cells ([heartshield.net](http://heartshield.net))
  - Significantly outperformed state of the art** in heart rate variability for screening (Madl 2016a, 2016b)
  - Developed models for heart attack prediction, atrial fibrillation detection, and heart sound classification
  - Consulting project for the *Dubai Corporation for Ambulance Services* (developed a novel pre-hospital self-triage system with machine learning, improving existing triage scores in accuracy and patient safety)
- 2016  
2017
- Visiting Postdoctoral Researcher, Machine Learning & Opt Group, Uni of Manchester, UK**
- Heart disease predictors based on deep learning models inspired by cardiac pacemaker cells (NIPS,2016)
  - Co-developed **novel semi-supervised deep learning** approach based on sum-product networks (UAI,2017)
  - Concurrently founded HeartShield, aiming to tackle the largest cause of death worldwide using smartphones and AI. **Filed patent; accepted government grant proposal (150k \$)**, published in NIPS & CinC.
- 2016
- Mentor and instructor, Insight Health Data Science, Boston, MA**
- Guiding aspiring data scientists (academics from top universities) in executing fast-paced projects, solving AI related challenges, helping to get from idea to strong model and web data product in under four weeks
- 2013  
2016
- Principal Investigator, Austrian Research Institute for Artificial Intelligence, Vienna, Austria**
- Won 340.000 \$ govt. grant usually awarded to professors and postdocs; supervised two postgrad researchers
  - Developed a brain-like model of spatial memory able to control a **humanoid robot** in the DARPA VRC simulator, **successfully mimicking human learning behavior**, based on LIDA proto-AGI & deep learning
  - Implemented **first predictive model of spatial memory structure** (only explanatory models existed before), using Bayesian nonparametric clustering with novel non-linear metric learning methods, robustly (87-95%) predicting buildings represented together by humans (based on building addresses & public APIs)
  - Contributed two new computational mechanisms to the LIDA proto-AGI (a brain-inspired cognitive architecture & aspiring Artificial General Intelligence model) on localization & mapping and attention

2011  
2012

**Postgraduate Researcher**, *Austrian Research Institute for Artificial Intelligence*, Vienna, Austria  
Investigating Requirements for Context-Awareness & Attempt to Implement it in Software Agents or Robots.  
o Developed a cognitive model simulating a mobile assistive robot for elderly or sick patients based on LIDA  
o Contributed models of 'cognitive atoms' (the structure of the cycles of thought in human brains) to LIDA

2008  
2011

**Web Programmer**, *intevo, biz:Consult GmbH, Skypark Secure Ltd.*, PHP, SQL, JS/HTML/CSS  
Various projects incl. complex backend (payment system & Enterprise Resource Planning systems) and front-end (e.g. built interactive Gantt charting project management tool from scratch)

## Skills

Coding Python, JavaScript, Java, PHP, HTML, CSS, R, MATLAB, C#.NET, C/C++, SQL  
Tools scikit-learn, PyTorch, tensorflow, autograd, autogluon, Flask & Django (deploying models as data products online), JS frameworks, Amazon AWS (EC2, S3, SageMaker, ...), Pandas, Scipy, Numpy

## Achievements

2022 ● **Machine learning patent filed**, *U.S. Patent Application Serial No.: 17/709,254*  
2016 ● **Machine learning patent filed**, *U.S. Patent Application Serial No.: 15/390,173*  
2013 ● **Project grant P25380-N23**, *FWF (Austrian Science Fund)*  
2016 ● **Best paper award runner-up**, *University of Manchester, UK*  
2014 ● **Scholarship of Achievement**, *University of Vienna, 2010, 2011*  
2010 ● **2nd, 3rd and 5th place**, *Austrian Physics Olympiad (2008, 2007, 2006)*  
2011 ●  
2006 ●  
2008 ●

## Education

2011 ● **PhD in Computer Science**, *University of Manchester, UK*  
2016 ●  
2009 ● **MSc in Cognitive Science**, *University of Vienna, Austria*, with distinction  
2011 ●  
2008 ● **BSc in Computer Science**, *University of Central Lancashire, UK*, first class with honours  
2009 ●

## PhD Thesis (Computer Science)

title ***Bayesian Mechanisms in Spatial Cognition: Towards real-world capable computational cognitive models of spatial memory.*** Resulted in 5 publications: (Madl et al., 2013, 2014, 2015, 2016a, 2016b)

## MSc Thesis (Cognitive Science)

title ***Tuning and Verifying a Psychologically Plausible Cognitive Architecture using LIDA-based cognitive software agents.*** Resulted in two peer-reviewed publications: (Madl et al., 2011, 2012)

## BSc Thesis (Computer Science)

title ***NPROG - Natural Language Programming*** (translate English program descriptions into Java)

## Open-Sourced Data Science Projects

Visualization ***highdimensional-decision-boundary-plot***: Estimating and plotting the decision boundary (decision surface) of machine learning classifiers in higher dimensions. (Based on own theoretical work)  
Interpretability ***sklearn-expertsys***: Highly interpretable classifiers for scikit learn, producing easily understood decision rules instead of black box models. (Based on Letham et al., 2015)  
Partial labels ***semisup-learn***: Semi-supervised learning frameworks for python, which allow fitting scikit-learn classifiers to partially labeled data. (Extends work by Loog; published with supervised student 2017)  
RF ***sklearn-random-rotation-ensembles***: Scikit-learn compatible implementations of the Random Rotation Ensemble idea of (Blaser & Fryzlewicz, 2016). Slightly improves tree-based classifier performance