

# Tamás Madarász - CV

---

Mediatek Research ◊ tamasmadarasz1@gmail.com ◊ tamasmadarasz.com

## Research Interests

---

- Reinforcement Learning • Model-Based Planning • Deep Learning
- Probabilistic World Models • Transfer, Multi-Task and Meta Learning
- Natural Language Processing • Computer Vision • Causality

## Application Domains

---

- Chip design • Compiler optimization • Drug discovery

## Positions

---

Dec 2021 -	Staff Research Scientist/Deep Learning Researcher Mediatek Research
Dec 2020 -Dec 2021	ML Researcher AI Theory Group, Noah's Ark lab Huawei UK R&D
June 2020 -Dec 2020	AI/ML fellow GlaxoSmithKleine
March 2018 - May 2020	Postdoctoral fellow University of Oxford, UCL
October 2015 - December 2017	Postdoctoral fellow University of Geneva, Laboratory of Cognitive Computational Neuroscience.

## Education

---

<b>PhD</b>	Center for Neural Science, New York University Advisors: Joseph E. LeDoux and Joshua P. Johansen.
<b>BA (Hons.)</b>	Mathematics, Trinity College, University of Cambridge.

**Diplôme Supérieur  
d'Enseignement**

Ecole Normale de Musique de Paris  
(Master's M2, Cello)

**Diplom**

Robert-Schumann-Academy, Düsseldorf  
Master of Music in Performance (Cello)

## **Awards**

---

2019        NeurIPS travel award  
2015        RLDM travel fellowship  
2015        COSYNE travel grant  
2014-2015   Samuel J. and Joan B. Williamson Dissertation Fellowship  
2014        NYU Dean's Dissertation Fellowship  
2014        NYU Dean's Travel Grant award  
2009-2014   MacCracken Graduate Fellowship  
1999-2002   Cambridge Overseas Trust and Trinity College full undergraduate scholarship  
2006-2008   Scholar of the French Government and the Île-de-France Regional Council

## **Publications**

---

**Madarasz TJ** (2022)

LPI: Learned Positional Invariances for Transfer of Task Structure and Zero-shot Planning.  
*ICML, 39th International Conference on Machine Learning, Workshop on Responsible Decision Making in Dynamic Environments.*

Parisot S, Esperanca PM, McDonagh S, **Madarasz TJ**, Yang Y, Li Z (2022)

Long-tail Recognition via Compositional Knowledge Transfer.

*CVPR, 2022 IEEE Conference on Computer Vision and Pattern Recognition .*

**Madarasz TJ** , Behrens TEJ (2020)

Learning transferable task schemas by representing causal invariances.

*ICLR, Eighth International Conference on Learning Representations, Causal learning for decision making workshop.*

**Madarasz TJ**, Behrens TEJ (2019)

Better transfer learning with inferred successor maps.

*NeurIPS, 33rd Conference on Neural Information Processing Systems, Vancouver, Canada.*  
**Spotlight oral presentation** (<3% of submissions).

**Madarasz TJ**, Behrens TEJ (2019)

Inferred predictive maps in the hippocampus for better transfer learning. **RLDM, Multidisciplinary Conference on Reinforcement Learning and Decision Making, Montreal.**

Yamada Y\*, Bhaukaurally K\*, **Madarasz TJ**, Pouget A, Rodriguez I, Carleton A (2017) Context- and output layer-dependent long-term ensemble plasticity in a sensory circuit. *Neuron*, Volume 93, Issue 5, 1198 - 1212.

**Madarasz TJ**, Diaz-Mataix L, Akhand O, Ycu EA, LeDoux, JE, Johansen JP (2016) Evaluation of ambiguous associations in the amygdala by learning the structure of the environment. *Nature Neuroscience* 19, 965–972.

**Madarasz TJ**, LeDoux JE, Johansen JP (2015) Evaluating predictive variables by a dual system of structure and parameter learning. **RLDM**, *Multidisciplinary Conference on Reinforcement Learning and Decision Making*, Edmonton.

## Conference Presentations

---

**Madarasz, TJ**, Behrens TEJ (2019) Flickering hope? Inferred hippocampal maps and splitter cells support multi-task learning COSYNE: *Computational and Systems Neuroscience*.

Fink AE, **Madarasz TJ**, LeDoux JE (2015) Short-term plasticity as a homeostatic mechanism in the lateral amygdala. *Society for Neuroscience*.

**Madarasz TJ**, Diaz-Mataix L, Akhand O, LeDoux JE, Johansen JP (2015) Evaluating ambiguous associations in the amygdala by learning the structure of the environment. COSYNE: *Computational and Systems Neuroscience*, Salt Lake City, Utah.

**Madarasz TJ**, Johansen JP, LeDoux JE (2013) Causality and its neural underpinnings in active and passive aversive learning. *Society for Neuroscience*.

**Madarasz TJ**, Diaz-Mataix L, Boyden SE, LeDoux JE, Johansen JP (2012) Temporally specific optogenetic inactivation of lateral amygdala pyramidal neurons reverses the effects of contingency degradation on fear learning. *Society for Neuroscience*.

**Madarasz TJ**, Roy SS, Boyden ES, LeDoux JE, Johansen JP (2011) Making predictions in a complex world: mechanisms of contingency degradation in fear conditioning. *Society for Neuroscience*.

Gervan P, Berencsi A, **Madarasz TJ**, Kovacs I (2010) Development and plasticity of primary visual and motor function in humans. *II. Dubrovnik Conference on Cognitive Science*.

## Invited Talks

---

SFN 2018, Computational Affective Neuroscience: Algorithms for Survival, minisymposium

COSYNE 2017, New Methods for Understanding Neural Dynamics and Computation Workshop

Rutgers University (June 2015)

Consulate General of Hungary, NYC, Hungarian Scientists Lecture Series (April 2015)

BSI Brain Lunch Seminar, RIKEN Brain Science Institute, Tokyo (October 2013)

International Workshop on Emotion and Time, Paris (June 2012)

## **Reviewing**

---

**Ad-hoc reviewer:** Science, Nature Neuroscience, Biological Cybernetics, IBM Journal of Research and Development

## **Teaching**

---

Computational and Cognitive Neuroscience Summer School, (2017), Shanghai.

Mathematical Tools for Cognitive and Neural Science (Graduate, Fall 2013), NYU-TA.

Cellular and Molecular Neuroscience (Fall 2012), NYU-TA.

Behavioral and Integrative Neuroscience (Spring 2012), NYU-TA.

Brain and Behavior (Spring 2011), NYU-TA.

Statistics, General Physics (2008-2009), Lecturer, McDaniel College, Budapest.

## **Mentorship**

---

Frank Catuela, Undergraduate Researcher, NYU.

Omar Akhand, Undergraduate Researcher, NYU.

Samit Roy, Undergraduate Researcher, NYU.

## **Internships**

---

2012, 2013 **RIKEN** Brain Science Institute

## **Programming Languages and Libraries**

---

Python, Matlab, C++, Tensorflow, Pytorch, Theano