Adrian Szatmari

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Canadian, Hungarian
34 years old

https://github.com/szat/

Languages :

- English, fluent,
- French, fluent, including written.
- Hungarian, fluent.
- I like learning languages.

INTERESTS

- Computer Vision
- Robotics
- Deep Learning
- Parallel Computing
- VR/AR/XR
- LLM

STACK

- C/C++, Python, CUDA, MPI.
- ROS2, 0MQ, Gstreamer, Ffmpeg.
- TF2, Pytorch, JAX.
- MongoDB, Jenkins, Git.

EDUCATION

MS APPLIED MATHEMATICS — **LEIDEN**
University of Leiden — 2013 – 2016

BS HONOURS PURE MATHEMATICS — **MONTREAL**
McGill University — 2009 – 2013

IBO APPLIED SCIENCES — **MONTREAL**
Cegep/College Jean-De-Brebeuf — 2007 – 2009

WORK EXPERIENCE

FREELANCING RESEARCH (PYTHON, JAX, CUDA, PYTORCH) — **BERLIN**
Working for my own enjoyment — Jan 2023 – Current

- LLM training and finetuning for video editing.
- Video editing command extraction using NN.
- Neural Radiance Fields in Jax and Pytorch.
- Plenoxels (NERF also) in Jax and Pytorch.
- Octree implementation research in Jax and Cuda.
- Superpixels (SLIC) in Jax and Cuda, 20 fps.
- Triniliear interpolation, 1.5x faster than SOTA.

DEEP LEARNING (PYTHON, CAFFE, TF2, MONGO DB) — **BERLIN**
Asaphus Vision — May 2021 – Jan 2022

- NN models for eye-gaze estimation.
- Data cleaning for eye-gaze estimation.
- Migrated the main database to MongoDB (speed-up 30x).
- Wrote Jenkins database upkeep routines.
- Added features to labeling GUI in QT.

R&D ENGINEER (C++, PYTHON, TF2, BLENDER) — **MONTREAL**
Thinkwell Group — Nov 2020 – Aug 2021

- Camera and projector simulation in Blender.
- Camera and projector positioning, with sub-pixel accuracy.
- 3D reconstruction from structured light.
- Object tracking in real time 60 FPS.
- New algorithm for image stitching.

INNOVATION ENGINEER (C++, CUDA, ROS2, GSTREAMER) — **DEN HAAG**
Fugro — Aug 2018 –Aug 2020

- Driver for FLIR cameras, 4K, 30 fps (Gstreamer).
- Gstreamer 180ms latency glass to glass pipeline (Gstreamer).
- CNN Gstreamer plugin (Gstreamer).
- Video stitching, 4K, 60 fps (Gstreamer).
- Driver for Sidus stepper motor via serial (ROS2).
- Driver for industrial thrusters (ROS2).
- Control system for thruster deadzone avoidance (ROS2).

SOFTWARE DEVELOPER (C++, CUDA, OPENCV) **MONTREAL**
NDim – startup initiative Mar 2017 – Nov 2017
Constructed a video view synthesis processing engine.

- Real-time warping in CUDA and OpenGL.
- Image registration in C++, CUDA and OpenCV.

BACKEND DEVELOPER INTERN (PYTHON, SQL) **AMSTERDAM**
TwelveCubes Inc. Sept 2014 – Jan 2015
Built APIs in SQL and and RESTful Django framework.

- Worked on path planning API for vehicles.
- Wrote event logger API for software crash reports.

RESEARCH

IMAGE MORPHING **MONTREAL**
Unsupervised Curve Morphing Sept 2017 – Present

Freelance research project on unsupervised shape, mesh and texture morphing. The idea is to look at a *shape* as a *word* in 2D or 3D space, and then use *string distance* between two shapes, i.e. which letters do you have to delete/insert/replace in order to change a word (shape) into another word (shape).

Link: https://github.com/szat/SmithWatermanMorphing

ROBOTIC PATH PLANNING **LEIDEN**
The n-Arm Robot Problem Nov 2015 – Sept 2016

Master thesis in distributed multithread robotic path-plannning. In motion planning, the amount of computation goes up exponentially with the number of actuators (because of the curse of dimensionality). By recasting the motion planning problem as a READ/WRITE concurrency problem, we were able to design an effective parallelisation framework.

Link: https://github.com/szat/MasterThesis

NUMERICAL PDES **MONTREAL**
Feb 2012 – May 2012
Symmetry analysis of a system of modified shallow-water equations.

Partial Differential equations often have a rich associated structure called symmetries. They allow to systematically find new solutions from old ones through group actions. This research found the complete family of such symmetries for the shallow-water equations. Research published in Elsevier.

Link : http://www.sciencedirect.com/science/article/pii/S1007570413002992

FAVOURITE COURSES

Neural Networks	(7.5)	Multimedia Systems	(8.5)
Information Th. Learning	(7.5)	Adv. Real Analysis	(A-)
Concurrency	(7.0)	Geometry and Topology	(A-)
Queueing Theory	(7.0)	Nonlinear Dynamics	(A-)
Parallel Algorithms	(7.0)	Numerical Analysis	(A-)

Autonomous Mobile Robots (online)
Deep Learning Certification with Andrew Ng (Coursera)

HOBBIES :

Calisthenics, Acro Yoga, Piano, Cooking, Swing Dancing.