

Micha Livne - Curriculum Vitae

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EMPLOYMENT SUMMARY	Postdoc, NVIDIA, Toronto, ON, Canada Feb. 2021 to present Postdoc in NVIDIA AI Application group, working on Neural Machine Translation (NMT) models. Postdoc, University of Toronto, ON, Canada July 2020 to Feb. 2021 I was working under Professor Geoffrey Hinton, with Professor David Fleet, and Kevin Swersky. Research internship in A.I. VALI, Toronto, ON, Canada Nov. 2019 to Feb. 2020 I developed a novel polyp detection AI-powered framework for medical imaging. Chief Research Scientist in Seraph Labs, Toronto, ON, Canada Nov 2014 to present I founded the company to provide research services in computer vision, NLP, and machine learning. Research internship in Adobe Research, Seattle, WA, USA June 2014 to Dec. 2014 I worked under Dr. Danny Kaufman on physically-plausible 3D tracking with an unknown environment. Research internship in Disney Research, Pittsburgh, PA, USA May 2013 to Nov. 2013 I worked under Dr. Leonid Sigal on 3D tracking of human body shape and pose from depth sensor. Research internship in Epson EDGE, Markham, ON, Canada Sept. 2011 to April 2012 I worked on robotic visual servoing with emphasize on calibrated and calibration-less solutions. Research internship in MERL, Boston, MA April 2010 to July 2010 I worked under Dr. Matthew E. Brand on a fast radiation therapy optimization problem. DA in Intel Development Center, Haifa, Israel March 2006 to July 2009 I worked as a Design Automation engineer (software engineer).	
EDUCATION SUMMARY	Ph.D. in Computer Science, University of Toronto, Canada June 2011 to April 2020 PhD in Computer Science under the supervision of professor David J. Fleet in machine learning. MSc. in Computer Science, University of Toronto, Canada Sept. 2009 to May 2011 MSc. in Computer Science under the supervision of professor David J. Fleet in computer vision. BSc. in Electrical Engineering, Technion, Israel Nov. 2004 to June 2009 Graduated summa cum laude (top 3% of my class). BSc. in Physics, Technion, Israel Nov. 2004 to June 2009 Graduated summa cum laude (top 3% of my class).	
REFERENCES	References are available upon request.	
PUBLICATIONS	See my Google Scholar profile.	

Postdoc, NVIDIA, Toronto, ON, Canada

July 2020 to Feb. 2021

Postdoc in NVIDIA AI Application group

- In my postdoc I am working on Neural Machine Translation (NMT) models . In particular, I am working on NMT with bottleneck, allowing for faster inference with minimal to no degradation in translation quality.
- Job Description: I am conducting machine learning research in the area of NMT
- Contributions, Skills and Expertise Acquired:
 - ◇ Accelerated translation speed up to 3 times (with an average of 1.5) while maintaining the same quality of translation
 - ◇ Worked with NeMo NLP and ASR research framework
 - ◇ Released open-source contributions to NeMo
 - ◇ Learned how to work with NGC (NVIDIA cloud) and NVIDIA internal cloud services
 - ◇ Worked with pytorch lightning on large-scale distributed experiments

Postdoc, University of Toronto, Toronto, ON, Canada

July 2020 to Feb. 2021

Postdoc in University of Toronto and Vector Institute

- During my postdoc I worked under Professor Geoffrey Hinton, with Professor David Fleet, and Kevin Swersky.
- Job Description: I conducted research on machine learning, specifically, on the foundations and applications of latent variable models.
- Skills and Expertise Acquired:
 - ◇ Leading cutting edge research in AI

Research Intern in A.I. VALI, Toronto, ON, Canada

Nov. 2019 to Feb. 2020

- I was a MITACS Accelerate fellow, and did a research internship in a medical imaging technology startup.
- Job Description: I developed a novel polyp detection AI-powered framework for medical imaging.
- Skills and Expertise Acquired:
 - ◇ Designing a novel research framework to solve a business-oriented problem
 - ◇ Incorporating novel research directions in product-oriented solutions

Technical Lead in Creative Destruction Labs, Toronto, ON, Canada

2019

Creative Destruction Labs (CDL) accelerator

- I successfully graduated CDL, 2019 cohort. I held a lead researcher role in a start-up (A.I. VALI) which participated in CDL 2019.
- Job Description: I worked closely with business experts in designing a novel polyp detection AI-powered framework. I provided technical and scientific expertise to a medical imaging technology startup.
- Skills and Expertise Acquired:
 - ◇ Working closely with business experts in designing a framework that support the technical needs of a startup
 - ◇ Communicating novel technology to a non-technical audience

- ◇ Designing a research framework that can be used in possible future directions of the company
- ◇ Incorporating novel research directions in product-oriented solutions

Chief Research Scientist in Seraph Labs, Toronto, ON, Canada Nov. 2014 to present

I founded Seraph Computer Vision Labs to provide research services to companies in the areas of computer vision, NLP, and machine learning.

- I founded an AI research lab, with the goal of pushing forward computer vision/machine learning research, while giving smaller start-ups (i.e., who typically cannot afford to hire full-time ML researchers) accessibility to one of the biggest revolutions that humanity is experiencing.
- Job Description: Managed, supervised, and executed end-to end research. I took an idea from discussion, through evidence-based research, into a working prototype, with multiple companies.
- Skills and Expertise Acquired:
 - ◇ Establishing, and managing a small company
 - ◇ Building research frameworks that can support research needs while taking production needs into account
 - ◇ Incorporating state-of-the-art research directions in product-oriented solutions
 - ◇ Managing a research team, while collaborating with other researches, and engineers

Research internship in Adobe Systems, Seattle, WA, USA June 2014 to Dec. 2014

Adobe Research - CTL (Creative Technologies Labs)

- Host: Dr. [Danny Kaufman](#)
- Job Description: Capturing Dynamics - developing 3D tracking of rigid objects with inference of physical properties and interaction with an unknown environment.
- Skills and Expertise Acquired:
 - ◇ Incorporated contact in Variational Integrator physical simulation framework while preserving the symplecticity of the system
 - ◇ Developed a simple rigid body 3D tracking ICP-like algorithm with RGBZ data
 - ◇ Developed a system that infers physical/geometrical parameters of a target model

Research internship in Disney Research, Pittsburgh, PA, USA May 2013 to Nov. 2013

DRP - Disney Research Pittsburgh

- Host: Dr. [Leonid Sigal](#)
- Job Description: Physics-based performance capture - developing accurate 3D tracking of human body shape and pose from monocular depth sensor.
- Skills and Expertise Acquired:
 - ◇ Developed a fast and accurate body mesh model
 - ◇ Developed an online tracking algorithm, with physics-based prior
 - ◇ Develop a contact predictor system to estimate contact of unknown environment

Research internship in Epson EDGE, Markham, ON, Canada Sept. 2011 to April 2012

Epson EDGE research group.

- Job Description: Solving robotic visual servoing problem with emphasize on both calibrated and calibration-less solutions.

- Skills and Expertise Acquired:
 - ◇ Programming capabilities including (but not limited to): OpenCV, Python SWIG bindings
 - ◇ Research and development of calibration-less visual servoing solution and automatic self-calibration procedure

Research internship in MERL, Boston, MA, USA

April 2010 to July 2010

MERL - Mitsubishi Electric Research Labs

- Host: Dr. [Matthew E. Brand](#)
- Job Description: Solving radiation therapy optimization problem using fast iterative QP (Quadratic Programming).
- Skills and Expertise Acquired:
 - ◇ Programming languages including (but not limited to): OpenMP, CUDA
 - ◇ Research and development of an iterative QP algorithm

DA in Intel Development Center, Haifa, Israel

March 2006 to July 2009

- Job Description: DA (Design Automation) Engineer. The job included developing and implementing methods and algorithms in order to automate certain aspects of the chip design process. The working period covered the entire chip design process.
- Skills and Expertise Acquired:
 - ◇ Programming languages including (but not limited to): Perl/Tk, Incr. TCL/Tk, C Shell (additional details below).
 - ◇ Unix/Linux.
 - ◇ Analyzing methodology problems and developing and implementing solutions
 - ◇ Working in team environments and individually and meeting firm work deadlines
- During the working period, I was reviewed highly at all employee assessments.
- Major Project: I contributed to the development and implementation of a unique and innovative methodology for modeling the time skew (uncertainty of signal time arrival) within computer chips.

EDUCATION

University of Toronto, Toronto, Ontario, Canada.

- Ph.D. in Computer Science **June 2011 to April 2020**
 - ◇ Supervisor: Professor [David J. Fleet](#)
 - ◇ Areas of Study: Machine Learning, Representation Learning, Bayesian Inference, NLP, Computer Vision, Optimization.
 - ◇ Thesis title: “Symmetric Variational Inference with High Mutual Information”.
- MSc. in Computer Science **Sept. 2009 to May 2011**
 - ◇ Supervisor: Professor [David J. Fleet](#)
 - ◇ Area of Study: Computer Vision.
 - ◇ Thesis title: “Human attributes from 3D pose tracking”.

Technion - Israel Institute of Technology, Haifa, Israel.

- BSc. in Electrical Engineering **Nov. 2004 to June 2009**
 - ◇ Final grade point average: 94.3/100, Summa cum laude (top 3% of my class).
 - ◇ Computer Science specialization.
 - ◇ Majors: Artificial Intelligence (Machine learning), Image Processing, Algorithms.
 - ◇ Minors: Systems Control, Signal processing.
- BSc. in Physics **Nov. 2004 to June 2009**
 - ◇ Final grade point average: 94.3/100, Summa cum laude (top 3% of my class).
 - ◇ Majors: Optics, Quantum mechanics.

TECHNICAL
SKILLS

Computer languages/frameworks:

- High proficiency: C/C++, UNIX Shells, MATLAB, L^AT_EX/L_AT_EX, Python, VTK, CMake, SWIG (Python), Pytorch, tensorflow.
- Intermediate proficiency: Assembly, Pascal, Java, Perl/Tk, Incr. TCL/Tk, CUDA, OpenCL, OpenMP, ITK.
- Familiarity with TCP/IP and network programming.

Computer Environments:

- High proficiency: Unix/Linux, Apple OS X.
- Intermediate proficiency: Windows.

High ability to learn new programming languages and environments as needed.

HONORS AND
AWARDS

University of Toronto, Toronto, Ontario, Canada.

- MITACS Accelerate Fellowship, 2019.
- Research contribution to **University of Toronto's Computational Vision Lab** was made on my behalf by **Disney Research** (\$30k), 2014.
- University MSc. graduate funding package. September 2009 to February 2011.
- University PhD. graduate funding package. February 2011 to 2016.
- Ray Reiter Graduate Award in Computer Science, 2011.

Technion - Israel Institute of Technology, Israel.

- I received BSc. degree in Electrical Engineering and BSc. in Physics, as part of a special program for excellent students. Both were awarded with summa cum laude.
- President's list of honors for scholastic achievements during the spring semester of 2004/05, and the spring semester of 2005/06. Dean's list of honors for scholastic achievements during the winter semester of 2005/06, the winter and spring semester of 2006/07, and during the winter semester of 2007/08.
- President's list of honors for scholastic achievements scholarship (spring semester of 2004/05, spring semester of 2005/06).
- Israel's ministry of education scholarship. 2007, 2008.

"May Boyar" High school, Jerusalem, Israel.

- Received high school diploma with honors.

LANGUAGES Hebrew Mother tongue
English High proficiency

MILITARY SERVICE **Officer (lieutenant) in the armed corps** **Nov. 1998 to Dec. 2002**

PERSONAL INFORMATION I enjoy facing challenges, whether at work, in an academic settings, or in life. I take a great pleasure in the process of solving problems.

- Personal interests:

- ◇ Trekking and camping, Basketball , Swimming, Motorbike riding, skiing, stand-up paddle boarding.
- ◇ I'm a big fan of music (with a diverse taste), and consider it a very big part of my life.
- ◇ I enjoy interactive art installations, and have worked on several such projects in the past.

- World experience:

- ◇ 2002-2004: I travelled after the military service for a year and a half in Asia. The trip included south East Asia (Thailand, Laos, Vietnam, and Cambodia), India and Nepal.