Shalev Lifshitz

AI Researcher, Engineer, & Entrepreneur

19 years old, Canadian, and striving to develop the future of technology. My goal is to spark the next wave of human innovation and help humanity reach a new evolutionary step.

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📱 https://www.linkedin.com/in/shalev-lifshitz/

📍 Toronto, Canada

🖥 shalev.ca

🐙 github.com/Shalev-Lifshitz

SKILLS

Leadership

Entrepreneurship

Deep Learning, Computer Vision, Supervised Learning, Reinforcement Learning

Python, Java, C#, C++

PyTorch, Tensorflow, OpenCV, NumPy, Matplotlib, Pandas, SciPy, Scikit-Learn

Git, Docker, PostgreSQL, Java Spring, Linux

Communication and Public Speaking

Critical Thinking and Problem Solving

Creativity   Writing

EDUCATION

Specializing in Computer Science, Minoring in Math and Psychology
Undergraduate at the University of Toronto

09/2020 - Present

WORK/RESEARCH EXPERIENCE

Researcher
University of Toronto, Prof. Sheila McIlraith's Group ⬈

09/2021 - Present   *Toronto, Ontario*

Conducting deep reinforcement learning research with Prof. Sheila McIlraith at the University of Toronto and Vector Institute for Artificial Intelligence.

ML Engineer - building algorithms to automatically understand CT scans
Claronav ⬈

01/2020 - Present   *Toronto, Ontario*

Creating Machine Learning algorithms to improve surgical navigation at Claronav, an industry leader in surgical navigation which developed the first FDA-cleared image-guided surgical navigation system. Instead of a human having to locate and annotate various structures in CT scans, I teach machines to figure out the location of these structures on their own. The algorithms I created are now being used in surgical navigation systems around the world to understand patient CT scans in less than half a second.

Researcher - histopathology image search for cancer diagnosis
University of Waterloo, Kimia Lab ⬈

06/2019 - 01/2021   *Waterloo, Ontario*

Created a new histopathology image search technique to speed up and improve the diagnosis of cancer and other diseases. I performed this research at the University of Waterloo KIMIA Lab (a global leader in histopathology image search). Paper (first-authored) is available at https://arxiv.org/abs/2111.15519.

Researcher - creating neural networks to behave more like the brain
University of Waterloo, Kimia Lab ⬈

09/2018 - 09/2019   *Waterloo, Ontario*

Worked directly with Prof. Hamid Tizhoosh to design a new type of neural network that aims to rethink the basic perceptron structure used in Deep Learning and move away from a feed-forward approach. We aimed to develop networks that can be easily embedded in larger graphs (inspired by the more organic structure of biological neural networks). I implemented and developed our novel neural architecture from scratch, without the use of existing Deep Learning libraries (since they were not able to perform our unique experiments). I spent over 400 hours implementing the network while maintaining academic excellence (95+ GPA). Paper is available at https://arxiv.org/abs/1909.12933.

Researcher - computer vision for faster and better diagnosis
The Hospital for Sick Children

06/2018 - 09/2018   *Toronto, Ontario*

Researched ML & Computer Vision techniques to diagnose genetic disorders from cell images.

INTERESTS

AI   Neuroscience

Neurosymbolism

INTERESTS

Multi-Agent RL

Cellular Automata

Physics, Sound, and Light Transport Simulations

Graphics & 3D

Game Development

General Relativity

Mathematical Proofs

LOTR   Piano

Causality   Latin

Ancient Greek and Roman Civilization

Ensuring a Positive Future for Humanity

TECHNICAL PROJECTS

Rendering engine with physics and sound simulations (12/2021 - Present)
Leading a team to build a rasterization rendering engine that uses physics and sound simulations to create a dynamic world. The rendering, physics, and sound engines/simulations are all created from scratch using C++.

AutoDirect.tech (09/2021 - 12/2021)
Worked in a team of 4 to develop AutoDirect.tech, a web application that enables buyers to easily view an assortment of cars with pre-approved financing, customized for their individual financial profiles. The project was performed in collaboration with Senso.AI, a Toronto startup (they provided the API which was used to determine loan offer pre-approvals for each buyer). I was responsible for most of the backend architecture and development, which used a Java Spring server and a PostgreSQL database server. The live website is available at https://autodirect.tech/ and the backend code is available at https://github.com/TLI-Group-1/Backend.

RESEARCH PAPERS

Subtractive Perceptrons for Learning Images: A Preliminary Report (09/2019)
We define the subtractive Perceptron (s-Perceptron), a graph-based neural network that delivers a more compact topology to learn one specific task. In this preliminary study, we test the s-Perceptron with the MNIST dataset, a commonly used image archive for digit recognition. The proposed network achieves excellent results compared to the benchmark networks that rely on more complex topologies. https://arxiv.org/abs/1909.12933

Gram Barcodes for Histopathology Tissue Texture Retrieval (12/2021)
We propose Gram barcodes, a new metric of tissue similarity for Histopathology Image Retrieval (HIR) systems. Unlike most feature generation schemes, Gram barcodes are based on high-order statistics that describe tissue texture by summarizing the correlations between different feature maps in layers of convolutional neural networks. We run HIR experiments on three public datasets using a pre-trained VGG19 network for Gram barcode generation and showcase highly competitive results. https://arxiv.org/abs/2111.15519

SPEAKING ENGAGEMENTS

Some of my speaking engagements:
- Talk at IFA (Berlin, Germany)
- Talk at Future Port Prague (Prague, Czech Republic)
- Talk at meConvention (Frankfurt, Germany)
- Panel at FiRe: Future in Review (San Diego, United States)
- Talk at ReWork Responsible AI Summit (Montreal, Canada)
- Talk at SXSW: South by Southwest (Austin, Texas)
- Talk at KPMG Executive Look (Toronto, Canada)

Please visit my website at shalev.ca for more videos of my speaking engagements and my portfolio. ⎘

AWARDS & ACHIEVEMENTS

C. David Naylor Scholarship from the University of Toronto ($20 000)

University of Toronto Scholar (2021)

University of Toronto, Trinity Collage Award (2021)

Winning Pitch at the McMaster University Fall 2018 Innovation Sprint

Best Startup Award at SAGE Canada