Shalev Lifshitz

AI Researcher & 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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Toronto, Canada

shalev.ca

SKILLS

- Leadership
- AI & Deep Learning
- Entrepreneurship
- Creativity
- Writing
- Programming
- Communication and Public Speaking
- Critical Thinking and Problem Solving

INTERESTS

- AI
- Neuroscience
- Neurosymbolism
- Multi-Agent RL
- Cellular Automata
- Physics, Sound, and Light Transport Simulations
- Graphics & 3D
- General Relativity
- Causality
- Latin
- Mathematical Proofs
- LOTR
- Piano

EDUCATION

Specializing in Computer Science, Minoring in Math and Psychology

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 learning research with Prof. Sheila McIlraith at the University of Toronto.

ML Engineer - AI algorithms to automatically understand CT scans

Claronav

01/2020 - Present — *Toronto, Ontario*

I have been creating AI 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 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*

While in high school, I worked with the Prof. Hamid Tizhoosh to design a new type of neural network that aims to rethink the basic perceptron structure 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 neural architecture from scratch, without the use of existing DL libraries since they were not able to perform our experiments. I spent over 400 hours implementing our novel neural network from scratch while maintaining academic excellence (95+ GPA). The neural architecture research is published in our paper "Subtractive Perceptrons for Learning Images: A Preliminary Report" (listed below).

Researcher - Computer vision for faster and better diagnosis

The Hospital for Sick Children

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

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

RESEARCH PAPERS

Subtractive Perceptrons for Learning Images: A Preliminary Report (09/2019)

In this preliminary work, we define the subtractive Perceptron (s-Perceptron), a graph-based neural network that delivers a more compact topology to learn one specific task. https://arxiv.org/abs/1909.12933

Gram Barcodes for Histopathology Tissue Texture Retrieval (12/2021)

We propose Gram barcodes, a new metric of similarity for Histopathology Image Search (HIR) systems that can help pathologists diagnose cancer and other diseases. 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. https://arxiv.org/abs/2111.15519

INTERESTS

Ancient Greek and Roman Civilization

Ensuring a Positive Future for Humanity

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)
- Talk at ReWork Responsible AI Summit (Montreal, Canada)
- Talk at SXSW: South by Southwest (Autsin, Texas)
- Panel at FiRe: Future in Review (San Diego, United States)
- Talk at KPMG Executive Look (Toronto, Canada)

Please visit my website at shalev.ca for 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