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 AI and Computer Vision methods that analyze cell images to expedite the diagnostic and drug discovery processes at The Hospital for Sick Children in Toronto.

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