

# Nikita Zozoulenko

## Curriculum Vitae

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## Education

- 2018–present **KTH Royal Institute of Technology**, *Engineering Physics*.  
2015–2018 **Katedralskolan in Linköping**, *High school, specialization in the natural sciences (NANAT)*,  
During my final year I read linear algebra at Linköping University.  
2011–2015 **International English School in Linköping**, *School year 6–9*.

## Work Experience

- June 2018 – **Machine Learning Engineer**, CONTEXTVISION AB, Linköping.  
August 2018 I worked in the field of digital pathology and developing new instance segmentation algorithms to detect cancer in hematoxylin and eosin stained medical images. During my employment I wrote a paper titled *Gland Instance Segmentation Through Overlapping Contour Regions and Random Transformation Sampling*.  
Summer 2017 **Museum Guide, Animal Handler and Gardener**, OPEN-AIR MUSEUM GAMLA LINKÖPING, Linköping.  
During the day I acted as a museum guide. During the mornings before we opened the museum I worked as a gardener and tended to the museum's various animals.  
Summer 2016 **Junior Consultant**, AB STÅNGÅSTADEN, Linköping.  
I worked as a group leader together with other junior consultants to find creative and innovative solution to problems facing Stångåstaden's real estate.

## Computer Skills

- Languages PYTHON, C++, JAVA, GLSL  
OS LINUX, WINDOWS  
Frameworks PYTORCH, TENSORFLOW, OPENGGL, L<sup>A</sup>T<sub>E</sub>X

## Languages

- Swedish Fluent  
English Fluent  
Russian Good translation skills in speech  
Spanish High school level, basic conversation and text

## Awards and Distinctions

- March 2018 **Winner in Utställningen Unga Forskare (english: Exhibition Young Scientists)**, SWEDEN.  
Utställningen Unga Forskare is a national pre-collage science and engineering fair where Sweden's best pre-collage students compete with their science or engineering projects. I entered with my machine learning project *Dense Face Detection* and won the first prize to represent Sweden internationally in the world biggest science and engineering fair, Intel ISEF, together with 2 other students.

- May 2018 **Intel International Science and Engineering Fair Finalist, USA.**  
Intel ISEF is the worlds biggest science and engineering fair where 1.8 million people all over the world have competed for the best 1800 to reach the final. I had the honor of receiving and winning one grand prize and two special prizes:
- 1:st award from *Association for the Advancement of Artificial Intelligence*
  - 3:rd award in the category of *Robotics and Intelligent Machines*
  - 4:th award from *Association for Computing Machinery*
- June 2018 **Tre Bröders Scholarship, LINKÖPING.**  
A scholarship for distinctions in studies in mathematics.
- June 2018 **Framtidsstipendiet (english: The Future Scholarship) from Östsvenska Handelskammaren, LINKÖPING.**  
A scholarship awarded to me for my development of a mathematical model for face detection in big crowds.

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## Personal Projects

- October 2018 **AlphaZero Pytorch Implementation.**  
Open source PyTorch implementation of a single threaded self play reinforcement learning agent with Monte Carlo Tree Search (MCTS). The model was used to learn  $n \times n$  tic-tac-toe with arbitrary size  $n$ .
- August 2018 **Rubiks Cube Agent.**  
A Rubik's Cube reinforcement learning agent. Trained without any human knowledge to solve any arbitrary cube by learning to predict the outcome of a Monte Carlo Tree Search predicting the Q-value of a certain action. Learned to solve any  $2 \times 2$  cube in an average time of 2.5 seconds.
- July 2018 **Gland Instance Segmentation Through Overlapping Contour Regions and Random Transformation Sampling.**  
This paper was written during my employment at ContextVision AB. I developed an algorithm for instance segmentation of glands in hematoxylin and eosin stained medical images with limited data using random transformation sampling.
- May 2018 **Improving Temporal Convolutional Networks.**  
I improved temporal convolutional neural networks and compared them to the traditional long short-term memory LSTM networks on the task of automatic image captioning.
- March 2018 **Real-time Style Transfer.**  
A collaborative Python and JavaScript project where the content of a camera stream gets transferred into a given artistic style in real time using style transfer, convolutional neural networks and a website GUI.
- March 2018 **Dense Face Detection.**  
My winning project for *Utställningen Unga Forskare*, using state of the art object detection algorithms. The final model is able to detect hundreds of faces in different shapes and sizes, in real time.

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## Other

I believe that a balanced lifestyle is important in life, and that character development is just as important as academic or professional development. That is why I try to be as active as I can outside of my studies and work. In my free time when I'm not working on personal projects I like to sing in a choir and train at least three times a week. My interests include music, training, personal development, artificial intelligence, nature and meeting new interesting people.

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## References

- **Martin Hedlund.** Chief Technology Officer (CTO) and co-founder of ContextVision AB  
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- **Gabriel Skantze,** Professor in Speech Communication and Technology at KTH Royal Institute of Technology.  
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