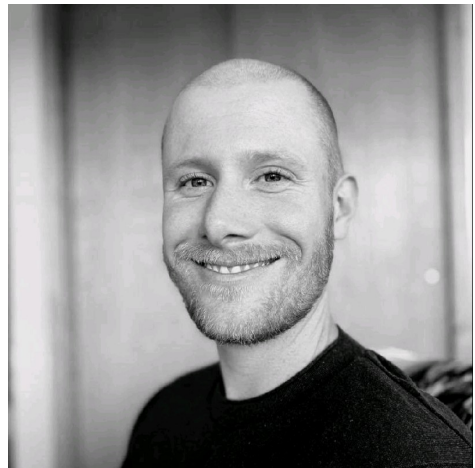


Gijs van Houtum

Computer vision engineer / Applied scientist



Summary

- 6+ years experienced applied research scientist in computer vision solutions for industrial applications
- History of leading successful machine learning/computer vision industry projects(5 companies).
- PhD candidate in computer vision focused on data-efficient adaptive deep learning models.
- MSc in control theory with thesis work on ML-based automated camera calibration using structured light.
- Specialized in semi-supervised video object segmentation deep learning based computer vision models using industrial sensors
- Winner of multiple grants for innovative ML collaboration with industry partners.
- Inventor of patented (PCT/CA2022/050956) active learning algorithm that reduces data annotation need by >70%

gjjvanhoutum@gmail.com
www.linkedin.com/in/gijsvanhoutum
+31645893354(NL)
+15198605331(CA)

Relevant work experience

Computer vision engineer / Applied scientist

Magna International (Headquarters)

Jan 2023 - TBD
Aurora, Canada

- R&D of adaptive vision-based deep learning defect detection and instance segmentation models for Laser-based metal additive manufacturing process. Work includes a novel coaxial camera solution, data acquisition/experiments, data annotation protocol, data training pipeline, model validation and visualization. Developed with Tensorflow, Python, OpenCV, ONNX, Linux
- Lead, train and supervise a team of 5+ people (domain experts/operators, Masters students) in sensor selection, data acquisition, data annotation, coding.
- Project has the potential to make this type of manufacturing the new standard and replace the classical welding robots in all of Magna's car manufacturing plants.

Entrepreneur, Market researcher

Lab2Market & Velocity Incubator UpStart Program

Sep 2021 - April 2023
Waterloo, Canada

- Lab2Market Grant won leading to a 10 week program on market research. Discovered the potential of adaptive machine vision solutions for the automotive, medical and aerospace industry. Interviewed 30+ companies.
- UpStart Grant won for my innovative work on adaptive vision-based models leading to a 12 Week program to bring my work to market. Networking with potential customers and investors.

Computer vision engineer / Applied scientist

Retinex

Jan 2021 - May 2021
Waterloo, Canada

- Project lead in developing machine learning solutions for melt-pool segmentation in laser powder-fed DED using in-situ vision-based (IR+VIS) process monitoring

- Lead, train and supervise a team of 5 people (domain experts, operators and students) in experimental design, data acquisition and annotation.
- R&D of hybrid deep learning image segmentation and classification model (only segments an image if classified correctly), data acquisition experiments, data annotation protocol, data training pipeline, model validation and visualization. Validation accuracy of 91% with added robustness, developed using Tensorflow, Python, OpenCV, ONNX, Linux

Computer vision engineer / Applied scientist

The Fraunhofer Innovation Platform for Advanced Manufacturing

Sep 2020 - Jan 2021
Enschede, Netherlands

- Project lead in developing a machine learning solution for iterative process parameter optimization in LPBF laser powder bed additive manufacturing processes.
- Close collaboration with Aeronamic B.V. (EOS M280) and Additive Industries for data acquisition and solution application.
- R&D of iterative layer-wise process parameter optimization using vision-based deep learning and particle swarm optimization.

Computer vision engineer / Applied scientist

Xiris Automation

Nov 2019 - Sep 2020
Burlington, Canada

- Project lead in developing machine learning solutions for vision-based melt-pool segmentation in laser-powder DED.
- Lead a team of 10+ people (domain experts/operators) in data acquisition and annotation (10000 images in 6 months).
- R&D of hybrid deep learning image segmentation and classification model (only segments an image if classified correctly)
- R&D of data acquisition experiments, data annotation protocol, data training pipeline, model validation and visualization. Validation accuracy of 86% with added robustness.
- Developed using Tensorflow, Python, OpenCV, ONNX, Linux

Graduate researcher, Camera calibration, Computer vision

Multi-Scale Additive Manufacturing Laboratory

Mar 2018 - Feb 2019
Waterloo, Canada

- R&D of machine learning based computer vision models that automatically calibrate cameras using structured light (laser).
- Developed interactive GUI desktop application able to record videos and calibrate cameras automatically using a line laser with Qt, Tensorflow, Python, OpenCV, Linux

Associate researcher, Computer vision

Multi-Scale Additive Manufacturing Laboratory

Jan 2017 - Mar 2018
Waterloo, Canada

- R&D of machine learning based computer vision models.
- Software development for data-related tasks using C/C++, OpenCV, Python, Tensorflow

Intern, Computer vision

Multi-Scale Additive Manufacturing Laboratory

Sep 2016 - Dec 2016
Waterloo, Canada

- R&D of machine learning based computer vision models that automatically calibrate cameras using structured light (laser).
- Developed interactive GUI desktop application able to record videos and calibrate cameras automatically using a line laser with Qt, Tensorflow, Python, OpenCV, Linux

Intern, Mathematical optimization

Control Systems Technology Center

- R&D of fast quadratic programming algorithm for application in Tokamak fusion reactors (ITER).

Feb 2015 - Aug 2016
Eindhoven, Netherlands

Intern, Researcher

Damen Schelde Naval Shipbuilding

- Structural eigenmode identification of naval vessels based on multi-source accelerometer sensor data.

Sep 2012 - Feb 2013
Vlissingen, Netherlands

Education

PhD, AI & Machine Learning

University of Waterloo | GPA: 9.4/10

Thesis: Data-efficient machine learning in additive manufacturing

Sep 2019 - Nov 2023 (expected)
Waterloo, Canada

MSc, Systems & Control

Eindhoven University of Technology | GPA: 7.9/10 (With distinction)

Final Thesis: Machine learning based camera calibration for additive manufacturing

Pre-master Thesis: Fast Quadratic Programming for Tokamak Fusion Reactors

Sep 2013 - June 2019
Eindhoven, Netherlands

BEng, Dynamics

Avans University of Applied Sciences

Final Thesis: Damping modelling in SIGMA class naval vessels

Minor: System dynamics and control theory

Sep 2009 - March 2013
Breda, Netherlands

Pre-university

Cobbenhagen College

2002 - 2008
Tilburg, Netherlands

Awards

- Winner of the UpStart velocity incubator program 2023
- 1st place America Makes AMNOW challenge 2022
- Winner of the Lab2Market E-Accelerate grant 2021
- Winner of Women in STEM grant 2020
- Winner of the NSERC HIAM Exchange program grant 2020

Skills

- **Programming:** Python(12+ years), C/C++, Matlab, Latex
- **Libraries:** Tensorflow, Pytorch, OpenCV, QT, Scikit-Learn, Pandas, Numpy, Scipy
- **OS:** Linux(12+ years primarily), Windows(when necessary)
- **Languages:** Dutch (Native), English (Full Professional), German

Publications

- [1] G. J. J. van Houtum and M. L. Vlasea, "Active learning via adaptive weighted uncertainty sampling applied to additive manufacturing", *Additive Manufacturing*, vol. 48, p. 102411, 2021.