



Mikkel Fly Kragh

MSc, PhD

Civil status

Married, 3 children

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Languages

Danish - native
English - professional
German - elementary

Experience

May. 24 - Now

Freelance: AI Tech Lead

[Trifork A/S](#)

At Trifork, I'm involved in three projects:

- Development and deployment of real-time computer vision systems for advanced driver assistance systems (ADAS)
- Development and validation of clinical prediction models for the Danish healthcare system
- Development and deployment of a machine vision inspection system for quality assurance

Feb. 23 - Now

Computer Vision and Machine Learning specialist

[Co-founder, AI Lab ApS](#)

Co-founder of AI Lab ApS (theailab.dk), an AI consultancy and development house located in Aarhus, Denmark. We offer prototype development, consultancy services and vision systems within the area of computer vision and deep learning.

Apr. 22 - Now

External examiner

[Danish Agency for Higher Education and Science](#)

External examiner (censor in Danish) on BSc and MSc engineering and master programs in Denmark. As an external examiner, I have assessed and graded both BSc and MSc theses within the areas of machine learning, deep learning, computer vision, and robotics.

Sep. 22 - Apr. 24

Freelance: Computer Vision Engineer

[CARIAD, Volkswagen Group](#)

Active learning (intelligent data collection) algorithms for self-driving cars. Deep learning model training for semantic segmentation and object detection. Model quantization with ONNX and ONNX Runtime (CPU/Cuda/TensorRT). Large investigation and usage of multiple experiment tracking tools. Modern Python development of a machine learning system (MLOps, experiment tracking, CI/CD in Azure, code review, pre-commits, linting, type-hints and environments).

Aug. 21 - Aug. 22

Senior Research Scientist

[Vitrolife A/S](#)

Use of deep learning and computer vision to optimize assisted reproduction technologies. As a research scientist, I was in charge of prototyping emerging technologies within machine learning, such as:

- Self-supervised learning on ~500,000 videos of fertilized human eggs
- Bias identification and mitigation using adversarial domain adaptation
- Uncertainty estimation and separation using ensemble models
- Model calibration using multivariate logistic regression
- Clinical relevance investigation of evaluation metrics for discrimination, calibration, and ranking performance of prediction models.

Additionally, I was in charge of scientific communication and research collaboration with both fertility clinics and universities. Here, I supervised BSc, MSc and PhD students in their scientific and AI-related collaborations with Vitrolife.

- May. 18 - Jul. 21 **Industrial Postdoc**
[Vitrolife A/S](#)
Automatic Scoring and Selection of Embryos for Improving Standard IVF Treatment (ASSIST).
Developed deep learning models on microscopy imaging surpassing human-level performance on embryo quality assessment. These models (Guided Annotation™ and iDAScore®) are currently in production and used daily by hundreds of fertility clinics worldwide.
- Dec. 14 - Apr. 18 **PhD Student**
[Department of Engineering, Aarhus University](#)
Lidar Sensing for Object Detection and Classification in Agriculture.
The project was part of the Safer Autonomous Farming Equipment (SAFE) project (Innovation Fund Denmark). I worked with sensor fusion techniques combining lidar sensing with color and thermal imaging as well as radar.

Education

- Dec. 14 - Apr. 18 **PhD**
[Department of Engineering, Aarhus University](#)
Thesis: *"Lidar Sensing for Object Detection and Classification in Agriculture"*
- Jan. 12- Jan. 14 **Master of Science in Information Technology**
[Department of Engineering, Aarhus University](#)
MSc thesis: *"Inspection of Glass Containers using Multi-target Particle Tracking and 3D Positioning"*
ECTS weighted average: 11.9 (7-step-scale)
- Aug. 08 - Jan. 12 **Bachelor of Engineering in Electronics and Computer Engineering**
[Aarhus School of Engineering](#)
BSc thesis: *"InSpot Intelligent Spotlight"*
ECTS weighted average: 11.6 (7-step-scale)

Selected Courses

- Aug. 15 **Summer School in Field Robotics**
[University of Southern Denmark](#)
PhD course, 7.5 ECTS
- Apr. 15 - Jul. 15 **Deep Learning for Image Analysis**
[Department of Engineering, Aarhus University](#)
PhD reading course, 5 ECTS
- Feb. 13 - Apr. 13 **Artificial Intelligence for Robotics**
[Udacity \(online\)](#)
MSc reading course, 5 ECTS
- Mar. 12 - Jun. 13 **Computer Vision**
[Department of Engineering, Aarhus University](#)
MSc course, 5 ECTS
- Dec. 16 - Jan. 18 **Self-Driving Car Engineer Nanodegree Program**
[Udacity \(online\)](#)
PhD course collection, 10 ECTS

Technology

Subject	Level	Years of experience
C	Low	2
C++	Medium	4
C#	Low	1
CI/CD	Medium	4
Camera Calibration	High	3
Computer Vision	High	13
Deep Learning	High	10
Git	High	8
Machine Learning	High	13
MLOps	Medium	4
MATLAB	High	5
Python	High	12
Pytorch	High	7
Research	High	10
ROS (Robot Operating System)	Medium	12
Sensor Fusion	Medium	3
Tensorflow / Keras	High	5

Selected Publications

- Oct. 24 **High-speed camera system for efficient monitoring of invasive plant species along roadways**
[F1000Research](#)
M. Dyrmann, S.K. Skovsen, P.H. Christiansen, M.F. Kragh, A. Krogh
- Jul. 23 **Comparing performance between clinics of an embryo evaluation algorithm based on time-lapse images and machine learning**
[Journal of Assisted Reproduction and Genetics](#)
M.N. Johansen, E.T. Parner, M.F. Kragh, K. Kato, S. Ueno, S. Palm, M. Kernbach, B. Balaban, I. Keleş, A.V. Gabrielsen, L.H. Iversen, J. Berntsen
- Mar. 23 **Development and validation of deep learning based embryo selection across multiple days of transfer**
[Nature, Scientific Reports](#)
J.T. Lassen, M.F. Kragh, J. Rimestad, M.N. Johansen, J. Berntsen
- Feb. 22 **Robust and generalizable embryo selection based on artificial intelligence and time-lapse image sequences**
[PLoS ONE](#)
J. Berntsen, J. Rimestad, J. Lassen, D. Tran, M.F. Kragh
- Oct. 21 **Predicting embryo viability based on self-supervised alignment of time-lapse videos**
[IEEE Transactions on Medical Imaging](#)
M.F. Kragh, J. Rimestad, J. Lassen, J. Berntsen, H. Karstoft
- Jun. 21 **Embryo selection with artificial intelligence: how to evaluate and compare methods?**
[Journal of Assisted Reproduction and Genetics](#)
M.F. Kragh, H. Karstoft
- Jun. 21
Abstract **Calibration of artificial intelligence (AI) models is necessary to reflect actual implantation probabilities with image-based embryo selection**
[ESHRE: European Society of Human Reproduction and Embryology](#)
M.F. Kragh, J. Lassen, J. Rimestad, J. Berntsen
- Sep. 20
Abstract **Opening the black box: relation between AI-predicted embryo implantation and traditional morphokinetic and morphological annotations**
[ASRM: American Society for Reproductive Medicine](#)
J. Berntsen, J. Rimestad, J. Lassen, M.F. Kragh
- Jun. 20
Abstract **Robust embryo scoring model based on artificial intelligence (AI) applied to a large time-lapse dataset**
[ESHRE: European Society of Human Reproduction and Embryology](#)
J. Rimestad, M.F. Kragh, J. Lassen, A. Tran, J. Berntsen
- Oct. 19 **Automatic grading of human blastocysts from time-lapse imaging**
[Computers in Biology and Medicine](#)
M.F. Kragh, J. Rimestad, J. Berntsen, H. Karstoft
- Jul. 19 **UnsuperPoint: End-to-end Unsupervised Interest Point Detector and Descriptor**
[arXiv preprint arXiv:1907.04011](#)
P.H. Christiansen, M.F. Kragh, Y. Brodskiy, H. Karstoft

- Jun. 19
Abstract **Automatic morphological grading of human blastocysts with time-lapse imaging and artificial intelligence**
[ESHRE: European Society of Human Reproduction and Embryology](#)
[M.F. Kragh](#), J. Rimestad, J. Berntsen, H. Karstoft
- Mar. 19 **Multi-Modal Obstacle Detection in Unstructured Environments with Conditional Random Fields**
[Journal of Field Robotics](#)
[M. Kragh](#), J. Underwood
- Apr. 18
Dissertation **Lidar-Based Obstacle Detection and Recognition for Autonomous Agricultural Vehicles**
[PhD Dissertation, AU Library Scholarly Publishing Services](#)
[M.F. Kragh](#)
- Mar. 18 **Multi-Modal Detection and Mapping of Static and Dynamic Obstacles in Agriculture for Process Evaluation**
[Frontiers in Robotics and AI](#)
T. Korthals, [M. Kragh](#), P. Christiansen, H. Karstoft, R.N. Jørgensen, U. Rückert
- Nov. 17 **FieldSAFE: Dataset for Obstacle Detection in Agriculture**
[MDPI Sensors](#)
M. Kragh, P. Christiansen, M.S. Laursen, M. Larsen, K.A. Steen, O. Green, H. Karstoft, R.N. Jørgensen
- Aug. 17 **Towards Inverse Sensor Mapping in Agriculture**
[International Conference on Intelligent Robots and Systems, Workshop](#)
T. Korthals, [M.F. Kragh](#), P. Christiansen, U. Rückert
- Jun. 17 **Platform for evaluating sensors and human detection in autonomous mowing operations**
[Precision Agriculture](#)
P. Christiansen, [M. Kragh](#), K. A. Steen, H. Karstoft, R. N. Jørgensen
- Dec. 16 **3D impurity inspection of cylindrical transparent containers**
[Measurement Science and Technology](#)
[M. Kragh](#), K. Bjerger, P. Ahrendt
- Jun. 16 **Multi-modal Obstacle Detection and Evaluation of Occupancy Grid Mapping in Agriculture**
[International Conference on Agricultural Engineering](#)
[M. K. Hansen](#); P. Christiansen, T. Korthals, T. Jungeblut, H. Karstoft, R. N. Jørgensen
- Jun. 16
Poster **Self-supervised Traversability Assessment in Field Environments with Lidar and Camera**
[International Conference on Agricultural Engineering](#)
[M. K. Hansen](#), J. Underwood, H. Karstoft
- Jan. 16 **Automatic behaviour analysis system for honeybees using computer vision**
[Computers and Electronics in Agriculture](#)
G. J. Tu, [M. K. Hansen](#), P. Kryger, P. Ahrendt
- Sep. 15 **Towards a DSL for Perception-Based Safety Systems**
[International Workshop on Domain-Specific Languages and models for Robotic systems](#)
J.T.I. Mogensen, S. Suvei, [M. K. Hansen](#), P. Christiansen, U. P. Schultz

- Jul. 15 **Advanced sensor platform for human detection and protection in autonomous farming**
[European Conference on Precision Agriculture](#)
P. Christiansen, M. Kragh, K. A. Steen, H. Karstoft, R. N. Jørgensen
- Jul. 15 **Object Detection and Terrain Classification in Agricultural Fields using 3D Lidar Data**
[International Conference on Computer Vision Systems](#)
M. K. Hansen, R. N. Jørgensen, H. Pedersen
- Feb. 12 **Kinect depth sensor evaluation for computer vision applications**
[Technical report](#)
M. Andersen, T. Jensen, P. Lisouski, A. Mortensen, M. Hansen, T. Gregersen, and P. Ahrendt