Mikkel **Fly Kragh**

MSc, PhD

Civil status
Married, 2 children

Address
Skjørringvej 12
8464 Galten
Denmark

Phone
+45 51761455

Mail
mikkel@theailab.dk

Web
theailab.dk
linkedin.com/in/mikkelkragh
github.com/mikkelkh
scholar.google.com

Languages
Danish - native
English - professional
German - elementary

Experience

Sep. 22 - Now
Consultant / Freelancer
AI Lab ApS
Co-founder of AI Lab ApS, an AI consultancy and development house located in Aarhus, Denmark. Currently contracting for CARIAD, an automotive software and technology company under the Volkswagen Group in Germany. I assist CARIAD with their work on intelligent data collection for autonomous driving development.

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 am 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 am in charge of scientific communication and research collaboration with both fertility clinics and universities. Here, I supervise 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 PhD project was a part of the Safer Autonomous Farming Equipment (SAFE) project sponsored by the Innovation Fund Denmark. In the project, I worked with sensor fusion techniques combining lidar sensing with color and thermal imaging as well as radar.

Dec. 10 - Apr. 18
Web Developer
Self-employed
Web development for small- and medium-sized companies.

Jan. 14 - Nov. 14
Research Assistant
Department of Engineering, Aarhus University
Development of video monitoring system of in-out activity at bee hives. Using OpenCV with C++, I implemented real-time tracking of honey bees and was responsible for constructing remote machine vision setups.

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	2
Camera Calibration	High	3
Computer Vision	High	11
Deep Learning	High	8
Git	High	6
Machine Learning	High	11
MLOps	Medium	3
MATLAB	High	5
Python	High	9
Pytorch	High	5
Research	High	9
ROS (Robot Operating System)	Medium	3
Sensor Fusion	Medium	3
Tensorflow / Keras	High	5

Selected Publications

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. Bjerge, 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