# Dr. Mennatullah Siam

*Curriculum Vitae*


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| *Mail* | mennatullah.siam@ontariotechu.ca |
| *Homepage* | https://msiam.github.io/homepage/ |
| *Linkedin* | https://www.linkedin.com/in/mennatullah-siam-6546508a/ |
| *Github* | https://github.com/MSiam |
| *Research* | Computer Vision, Deep Learning, Few-shot Learning, Video Segmentation |


## ACADEMIC POSITIONS

**Assistant Professor** 7/2023

*Ontario Tech University, Engineering and Applied Sciences, Full time.*

Image and Video Understanding (IVU) Lab

**Assistant Professor-Term** 2/22-7/22

*Nile University, Information Technology and Computer Science, Part time.*

Teaching Computer Vision CIT-690 Course

## EDUCATION

**PhD in Computing Science** 2015-2021

*University of Alberta*

Under supervision of Professor Martin Jagersand.
Thesis Title: learning video object segmentation from limited labeled data.
GPA: 4.0/4.0, Thesis Nominated for Department Award.

**MSc. in Communication and Information Technology** 2010-2013

*Nile University*

Under supervision of Dr. Mohamed ElHelw.
Thesis Title: Robust Target Detection and Tracking.
GPA: 3.8/4.0

**BSc. in Computer Science** 2006-2010

*Ainshams University*

Graduation Project: Movable Interactive Display using Wii-Mote.
Score: 86.2%, Grade: Excellent with Honour.
Rank: 1st on Department, 2nd on Class.

## PUBLICATIONS


[1] Mennatullah Siam, "Learning video object segmentation from limited labelled data," *PhD thesis, University of Alberta*, 2021.

[2] Rezaul Karim, He Zhao, Richard P. Wildes, and Mennatullah Siam, "MED-VT: Multiscale encoder-decoder video transformer with application to object segmentation," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2023.

[3] Matthew Kowal, Mennatullah Siam, Md Amirul Islam, Neil D.B. Bruce, Richard P. Wildes, and Konstantinos G. Derpanis, "A deeper dive into what deep spatiotemporal networks encode: Quantifying static vs. dynamic information," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2022, pp. 13999–14009.

[4] Mennatullah Siam, Naren Doraiswamy, Boris N. Oreshkin, Hengshuai Yao, and Martin Jägersand, "Weakly supervised few-shot object segmentation using co-attention with visual and semantic embeddings," in *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence*, 2020, pp. 860–867.

[5] Mennatullah Siam, Boris N. Oreshkin, and Martin Jagersand, "AMP: Adaptive masked proxies for few-shot segmentation," in *Proceedings of the IEEE International Conference on Computer Vision*, 2019, pp. 5249–5258.

[6] Mennatullah Siam, Chen Jiang, Steven Lu, Laura Petrich, Mahmoud Gamal, Mohamed Elhoseiny, and Martin Jagersand, "Video object segmentation using teacher-student adaptation in a human robot interaction (HRI) setting," in *Proceedings of the International Conference on Robotics and Automation*, 2019, pp. 50–56.

[7] Masood Dehghan*, Zichen Zhang*, Mennatullah Siam*, Jun Jin, Laura Petrich, and Martin Jagersand (* equally contributing), "Online object and task learning via human robot interaction," in *Proceedings of the International Conference on Robotics and Automation*, 2019, pp. 2132–2138.

[8] Mennatullah Siam, Sara Eikerdawy, Mostafa Gamal, Moemen Abdel-Razek, Martin Jagersand, and Hong Zhang, "Real-time segmentation with appearance, motion and geometry," in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2018, pp. 5793–5800.

[9] Mennatullah Siam*, Mostafa Gamal*, Moemen Abdel-Razek*, Martin Jagersand, and Senthil Yogamani (* equally contributing), "RTSeg: Real-time semantic segmentation comparative study," *Proceedings of the IEEE International Conference on Image Processing*, 2018.

[10] Mennatullah Siam, Heba Mahgoub, Mohamed Zahran, Senthil Yogamani, Martin Jagersand, and Ahmad El-Sallab, "MODNet: Moving object detection network with motion and appearance for autonomous driving," *Proceedings of the IEEE International Conference on Intelligent Transportation Systems*, 2018.

[11] Mennatullah Siam, Sara Elkerdawy, Martin Jagersand, and Senthil Yogamani, "Deep semantic segmentation for automated driving: Taxonomy, roadmap and challenges," in *Proceedings of the IEEE International Conference on Intelligent Transportation Systems*, 2017, pp. 1–8.

[12] Mennatullah Siam, Rezaul Karim, He Zhao, and Richard P. Wildes, "Multiscale memory comparator transformer for few-shot video segmentation," in *Proceedings of the IEEE International Conference on Computer Vision* ***(under review)***, 2023.

[13] Mennatullah Siam, Konstantinos G Derpanis, and Richard P Wildes, "Temporal transductive inference for few-shot video object segmentation," *arXiv preprint arXiv:2203.14308*, 2022.

[14] Matthew Kowal, Mennatullah Siam, Md Amirul Islam, Neil D.B. Bruce, Richard P. Wildes, and Konstantinos G. Derpanis, "Quantifying and learning static vs. dynamic

information in deep spatiotemporal networks," *IEEE Transactions on Pattern Analysis and Machine Intelligence* ***(under review)***, 2022.

[15] Mennatullah Siam, Konstantinos G. Derpanis, and Richard P. Wildes, "Temporal transductive inference for few-shot video object segmentation," in *Machine Learning for Autonomous Driving Workshop in Neurips*, 2021.

[16] Mennatullah Siam, Alex Kendall, and Martin Jagersand, "Video class agnostic segmentation benchmark for autonomous driving," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops*, June 2021, pp. 2825–2834.

[17] Mennatullah Siam, Boris Oreshkin, and Martin Jagersand, "Adaptive masked weight imprinting for few-shot segmentation," *Learning from Limited Labelled Data ICLR Workshop*, 2019.

[18] Mennatullah Siam, Heba Mahgoub, Mohamed Zahran, Senthil Yogamani, Martin Jagersand, and Ahmad El-Sallab, "Motion and appearance based multi-task learning network for autonomous driving," *Machine Learning for Intelligent Transportation Neurips Workshops*, 2017.

[19] Eslam Mohamed, Mahmoud Ewaisha, Mennatullah Siam, Hazem Rashed, Senthil Kumar Yogamani, Waleed Hamdy, Mohamed El-Dakdouky, and Ahmad El Sallab, "Monocular instance motion segmentation for autonomous driving: Kitti instancemotseg dataset and multi-task baseline," in *Proceedings of the IEEE Intelligent Vehicles Symposium*, 2021, pp. 114–121.

[20] Sepehr Valipour, Mennatullah Siam, Martin Jagersand, and Nilanjan Ray, "Recurrent fully convolutional networks for video segmentation," in *Proceedings of the IEEE Winter Conference on Applications of Computer Vision*, 2017.

[21] Abhineet Singh, Mennatullah Siam, and Martin Jagersand, "Unifying registration based tracking: A case study with structural similarity," in *Proceedings of the IEEE Winter Conference on Applications of Computer Vision*, 2017.

[22] Bjarne Großmann, Mennatullah Siam, and Volker Krüger, "Comparative evaluation of 3d pose estimation of industrial objects in rgb pointclouds," in *Proceedings of the International Conference on Computer Vision Systems*, 2015, pp. 329–342.

[23] Mennatullah Siam and Mohammed Elhelw, "Enhanced target tracking in uav imagery with pn learning and structural constraints," in *Proceedings of the IEEE International Conference on Computer Vision Workshops*, 2013, pp. 586–593.

[24] Menna Siam, Ramy ElSayed, and Mohamed ElHelw, "On-board multiple target detection and tracking on camera-equipped aerial vehicles," in *Proceedings of the IEEE International Conference on Robotics and Biomimetics*, 2012, pp. 2399–2405.

## PATENTS

- Mennatullah Siam, Senthil Yogamani, Ahmad ElSallab, and Heba Mahgoub. "Motion and Appearance Based Multi-Task Learning of Motion Segmentation and Vehicle Detection", `https://worldwide.espacenet.com/publicationDetails/biblio?CC=DE&NR=102018114229&KC=&FT=E&locale=en_EP#`.

## RESEARCH AND INDUSTRIAL EXPERIENCE

**Postdoctoral Fellow** 7/21-7/23
*York University, Lassonde School of Engineering, Full time.*
CVIL York Lab

Under supervision of Professor Richard Wildes
Research:

- Dynamics biased automatic video object segmentation.
- Intepretability of spatiotemporal models.
- Fewhsot video object segmentation.
- Multiscale video transformers for dense predictions.

**Postdoc Researcher** 3/22-2/23
*Vector Institute, Full time.*

**Research Assistant** 2015-2021
*University of Alberta, CS Dept, Full time.*
Computer Vision and Robotics Lab.

Research:

- Few-Shot Semantic Segmentation.
- Automatically generating motion segmentation dataset KITTIMoSeg for autonomous driving. `http://www.cvlibs.net/datasets/kitti/raw_data.php`
- Motion Adaptation for Video Object Segmentation using Human Robot Interaction.
- Real-time Segmentation using Appearance, Motion and Geometry.
- "Online Tool and Task Learning", that is part of the KUKA Innovation Award. Our team (Team Alberta) is one of the five finalists. I worked on the training of new objects from few samples and incrementally learning objects online.
- Video Class Agnostic Segmentation for Autonomous Driving in Collaboration with Wayve.
- Deep Semantic Segmentation Survey for Automated Driving.

**Machine Learning Engineer Intern** 6-12/2020
*Wayve Ltd, London, UK.*
Intern Project:

- Video Class Agnostic Segmentation in Autonomous Driving.

**Research Intern** 8/19-4/20
*Huawei Research, Edmonton, Canada.*
Intern Project:

- Few-shot Weakly Supervised Semantic Segmentation using Co-Attention.

**Software Engineering Intern** 6-9/2018
*Autonomous Driving Team, Nvidia Corporation, Santa Clara, US.*

**Software Engineering Intern** 5-7/2017
*Valeo Vision Systems, Ireland and Deep Learning Research Team in Egypt.*
Intern Project:

- Motion Segmentation using combined motion and appearance for Autonomous Driving.
- Multi-task Learning System with combined motion and appearance cues.

**Research Assistant** 2013-2014

*Nile University, Full time*

Ubiquitous Computing and Vision Lab.

Research:

- Very Small Target Detection and Tracking based on Image Registration.

**Software Engineering Intern** 2012-2013

*Sony Stuttgart Technology Center, Germany*

Research:

- Monopole Synthesis Controlled using a PS Move and PS Eye for 3D sound generation.

**Research Assistant** 2010-2012

*Nile University, Egypt.*

Ubiquitous Computing and Vision Lab.

Research:

- Automatic Target Detection and Tracking, based on motion estimation and clustering of outlier features. (First prototype was using Image Registration but for better computational performance, only outliers estimation was used)
- Automatic Target Tracking using P-N Learning and Exploiting Data Association as structural constraints.

## SCHOLARSHIPS AND AWARDS

- VISTA Postdoctoral Fellowship. 2021-2023.
- Alberta Innovates Technology Futures Graduate Scholarship (PhD). 2017-2019.
- Alberta Graduate Excellence Scholarship. 2019.
- Verna Tate Graduate Scholarship in Science, nominated from Computing Science Department, University of Alberta. 2019.
- KUKA Innovation Award Finalist team. 2018.
- Nile University Graduate Scholarship (MSc). 2010-2012.

## INVITED TALKS

- (Keynote) "Learning Scene and Video Understanding with Limited Labelled Data". Black in AI workshop, co-located with Neurips, 2022.
- "Image and Video Class Agnostic Segmentation". Huawei, Canada, 2021.
- "Image and Video Class Agnostic Segmentation". York University, Canada, 2021.
- "On the Intersection of Few-shot and Video Object Segmentation." Doctoral Consortium, CVPR. Online, 2021.
- "Few-shot Learning Tutorial." Samsung AI, Canada, 2022.

## ACADEMIC SERVICE

- Organizer of $2^{nd}$ Workshop on Learning with Limited Labelled Data for Image and Video Understanding (L3D-IVU) in CVPR 2023.
- Organizer of Learning with Limited Labelled Data for Image and Video Understanding (L3D-IVU) Workshop in CVPR 2022, [1].
- Technical committee member in Medical Image Learning with Limited and Noisy Data (MILLand) Workshop in MICCAI 2022, 2023 [2].
- Organizer CV4Africa workshop, Deep Learning Indaba, Accra, Ghana, 2023.
- Organizer and mentor in Black in AI social, CVPR, Vancouver, Canada, 2023.
- Guest Editor of special issue in Remote Sensing Journal on Autonomous Driving [3], 2022.
- Reviewer in ICRA, IROS, ECCV2020, WACV2020, CVPR 2021, ICCV 2021, WACV 2022, CVPR 2022, CVPR 2023, ICCV 2023.
- Program Committee Member in Machine Learning for Autonomous Driving Workshop - Neurips 2020, 2021.
- Reviewer in IJCV, TPAMI, Pattern Recognition Letters, IEEE Intelligent Systems, IEEE Transactions on Robotics.
- Area chair, IEEE CVF Winter Conference on Applications of Computer Vision (WACV), 2023.

## TEACHING EXPERIENCE

**Instructor CIT 690** Spring 2022
*Nile University*
Computer Vision for Master students in ITCS School, Course Material Preparation, Instruction, and guiding the TA.

**Co-Instructor MM 805** Winter 2021
*University of Alberta*
Computer Vision and 3DTV for Master students in Multimedia Program, Course Material Preparation and Instruction

**TA CMPUT 174** Fall 2015
*University of Alberta*
Introduction to the Foundations of Computation I

**TA CMPUT 174** Winter 2016
*University of Alberta*
Introduction to the Foundations of Computation I

**TA CMPUT 175** Fall 2017
*University of Alberta*
Introduction to the Foundations of Computation II

**TA CMPUT 175** Fall 2018
*University of Alberta*

[1] https://sites.google.com/view/l3d-ivu/
[2] https://zghada90.wixsite.com/milland/committee
[3] https://www.mdpi.com/journal/remotesensing/special_issues/75B73YS791

Introduction to the Foundations of Computation II

**Deep Semantic Segmentation Workshop** 5/2019

*IndabaX-Egypt*

I instructed a workshop on deep semantic segmentation part of Deep Indaba X Egypt 2019

**Workshop Instructor** 5/2020

*University of Alberta*

Preparation and Instruction of one day DL workshop for Master students in Multimedia Program Computing Science Department

## VOLUNTEERING EXPERIENCE

**Super Volunteer** 2021, 2022

*WiML Neurips 2021, 2022*

Volunteering in helping out workshop organizers in different tasks.

**Mentor** 2019-2020

*Black in AI*

Helped as a mentor in the mentoring program within BAI to guide a student in his application towards graduate school.

**Conference Volunteer** 2019

*ICRA*

Volunteered in helping out in the workshops and sessions logistics.

**Co-Founder** 2022

*Ro'ya CV4Africa Initiative*

Volunteered to start a computer vision for Africa community as part of the Deep Learning Indaba. [4]

## SKILLS

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| *Languages* | Arabic (mother tongue)<br>English (fluent), Toefl IBT: 109/120 |
| *Programming Languages* | Python, C++, MATLAB (V.Good). |
| *Frameworks* | Tensorflow, Keras, Pytorch, Caffe, OpenCV. |

## REFERENCES

1. Prof. Richard Wildes. Postdoc Supervisor, York University. Email: wildes@cse.yorku.ca.
2. Prof. Martin Jagersand. PhD Supervisor, University of Alberta. Email: jag@cs.ualberta.ca.
3. Dr. Boris Oreshkin. Collaborated with on few-shot learning work. Senior Research Scientist in Amazon, Montreal, Canada. E-mail: boris.oreshkin@gmail.com.

[4] https://ro-ya-cv4africa.github.io/homepage/