Abdelrahman Eldesokey

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I am a 4th year PhD student at the Computer Vision Laboratory (CVL), Linköping University, Sweden under the supervision of Prof. Michael Felsberg. I am also affiliated with the Wallenberg Autonomous Systems and Software Program (WASP). My main research focus is sparsity and uncertainty-aware CNNs with applications to scene depth completion (LiDAR), optical flow, and multi-modality fusion. I also have an experience with common vision tasks such as object detection/tracking, semantic segmentation, and optical flow throughout several industrial projects.

Professional Experience:

- **Nov 2016 – Present:** PhD Student, Computer Vision Laboratory (CVL), Linköping University, Sweden.
  - **Normalized Convolutional Neural Networks:** A VR project that aims to develop a sparsity/uncertainty-aware CNN layer to be used in applications with sparse data such as LiDAR, optical flow, and RGB-D.
  - **Temporal Consistency for Active Learning:** A course project with Zenuity company that aims to exploit temporal consistency in videos through optical flow estimation to design an active learning pipeline for various computer vision tasks.
  - **Object Detection in Thermal Imagery:** A collaboration project with Termisk Systemteknik company to detect vehicles in thermal images.
  - **CYKLA:** A joint project with Veoneer company to detect and track cyclists in driving scenarios. My role was to design wheels detection pipeline based on ellipse detection to construct a state-space representation.

- **May 2016 – Oct 2016:** Research Assistant, Computer Vision Laboratory (CVL), Linköping University.
  - **Pedestrians Detection and Tracking from UAVs:** Detect pedestrians at different scales from UAVs and track them through different environmental variations such as occlusion and illumination. This was done as a part of CUAS project.
  - **RoboCup:** Create a visual-aiding system for NAO robots to allow them to play soccer. This system included robot detection, ball detection, odometry estimation/correction and was developed in C++ using OpenCV.

- **Oct 2013 – Apr 2016:** Research Assistant, Center of Informatics, Nile University, Egypt.
  - **TraffiSense:** A traffic monitoring system that aims to detect, classify, and track vehicles in complex traffic scenarios. The system runs out-of-the-box by training in urban locations using automatically-generated training data. The whole system was developed in C++ using OpenCV.
  - **License Plate Recognition:** Develop a system for Egyptian license plates based on CNNs and classical Machine Learning approaches. Plate detection part was written in Matlab and the recognition part in Python using pylearn2 library.
  - **Adaptive Visual Trackers:** Investigate several approaches for object tracking such as optical flow, particle filters, compressive sensing, boosting, tracking-by-detection and motion compensation in order to develop robust tracker for challenging sequences, mainly in aerial imagery.
  - **Detection of very small moving targets:** Detect and track very small targets (almost 4 pixels) in aerial imager using video registration, connected components analysis and blobs tracking.

Education:

- **Nov 2016 – Present:** PhD candidate at the Computer Vision Computer Vision Laboratory (CVL), Linköping University, Sweden.
    - *Topic:* Sparsity and Uncertainty-Aware Convolutional Neural Networks.
    - *Supervisor:* Prof. Michael Felsberg.
    - *Planned Defense:* Spring 2021.

- **Oct 2013 – April 2016:** MSc in Communication and Information Technology, Center of Informatics, Nile University, Gizah, Egypt.
    - *cGPA:* 3.97
    - *Supervisor:* Assoc. Prof. Mohamed Elhelw.
    - *Thesis:* "The AERIAL tracker: A Robust Visual Tracker for Miro-Drones"
    - *Courses:* Computer Vision, Advanced Machine Learning, Scientific Computing, Visual Computing, Computer Graphics.

- **Sept 2007- Aug 2011:** BSc in Computers and Systems Engineering, Computers & Systems dept., Mansoura University, Mansoura, Egypt.
    - *Grade:* Excellent with honors (84.39%). *Rank:* 4/180.
    - *Graduation project:* "Augmented Reality platform on Android for Educational Applications".

Publications:

1. [2020] **A. Eldesokey**, M. Felsberg, K. Holmquist, and M. Persson, "Uncertainty-Aware CNNs for Depth Completion: Uncertainty from Beginning to End", Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020.
2. [2019] **A. Eldesokey**, M. Felsberg, and F. S. Khan, "Confidence Propagation Through CNNs for Guided Sparse Depth Regression", IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI).
3. [2018] A. Nyberg, **A. Eldesokey**, David Dr Gustafsson, David Bergström, "Unpaired Thermal to Visible Spectrum Transfer using Adversarial Training", Multimodal Learning and Applications Workshop (MULA) - ECCV 2018.
4. [2018] **A. Eldesokey**, M. Felsberg, and F. S. Khan, "Propagating Confidences through CNNs for Sparse Data Regression", The British Machine Vision Conference (BMVC) 2018.
5. [2017] **A. Eldesokey**, M. Felsberg, and F. S. Khan, "Ellipse Detection for Visual Cyclists Analysis "In the Wild"." International Conference on Computer Analysis of Images and Patterns. 2017.
6. [2016] **A. Eldesokey**, "The AERIAL tracker: A Robust Visual Tracker for Miro-Drones" Master's thesis.
7. [2015] R. Elhakim, **A. Eldesokey**, M. Abdelwahab and M. Elhelw, "TraffiSense- A Smart Integrated Visual Sensing System for Traffic Monitoring" in IntelliSys, 2015.
8. [2014] S. Elkerdawys, **A. Eldesokey**, A. Salahudein and M. Elhelw, "Scale-Adaptive Object Tracking with Diverse Ensemble" in 10th International Symposium on Visual Computing, 2014.
9. [2014] **A. Eldesokey** and M. Elhelw, " Multiple Classifier Systems for Improved Visual Tracking in Aerial Imagery" in IEEE ROBIO on Robotics and mimetics, 2014.

Honors and Awards:

- Became an Affiliated WASP PhD student (2017).
- Graduate Scholarship from Nile University for master's degree (2013).
- Honor degree for outstanding performance in BSc from Mansoura University (2011).
- One of Top 10 BSc projects in Egypt by IEEE Gold (2011).

Technical Skills:

- **Programming:**

Language	Years of Experience	Last Used
Python	6 Years	Present
Matlab	10 Years	Present
C/C++	7 Years	2016

- **Deep Learning Frameworks:** PyTorch (Expert), TensorFlow (Intermediate).

References:

Available upon request.