Wouter Van Gansbeke

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RESEARCH INTERESTS

Understanding Visual Scenes: Modeling geometry, discovering objects and patterns in complex scenes.
Self-Supervised Learning: Learn useful representations without annotations by leveraging visual similarities.
Multi-Task Learning: Solve multiple tasks concurrently with smaller memory footprint, less calculations and better accuracy than *single-task learning*.

EDUCATION

University - KU Leuven   Leuven, Belgium
PhD Candidate at ESAT-PSI - Center for Processing Speech and Images   *Dec. 2018 – Present*
- Focus: Self-Supervised Learning, Multi-Task Learning, Scene Understanding
- Goal: Achieve large scale autonomy with limited human supervision
- Supervisor: Prof. Luc Van Gool

University - KU Leuven   Leuven, Belgium
Master of Science in Electrical Engineering   *Sept. 2016 – June 2018*
- Focus: Information Technology - Embedded Systems and Multimedia (*Distinction*)
- Thesis: Real-time Scene Understanding for Autonomous Driving,
  supervised by Prof. Luc Van Gool (*Great distinction*)

University - KU Leuven   Leuven, Belgium
Bachelor in Engineering Science   *Sept. 2013 – June 2016*

PUBLICATIONS

Publications into top-tier conferences and journals, i.e. NeurIPS, ICCV, ECCV and TPAMI.
Over 800 citations according to Google Scholar.

Discovering Object Masks with Transformers for Unsupervised Semantic Segmentation.
Wouter Van Gansbeke, Simon Vandenhende, Luc Van Gool
Arxiv Preprint, 2022.

Revisiting Contrastive Methods for Unsupervised Learning of Representations.
Wouter Van Gansbeke*, Simon Vandenhende*, Stamatios Georgoulis, Luc Van Gool
Advances in Neural Information Processing Systems (NeurIPS), 2021.

Unsupervised Semantic Segmentation by Contrasting Mask Proposals.
Wouter Van Gansbeke*, Simon Vandenhende*, Stamatios Georgoulis, Luc Van Gool
International Conference on Computer Vision (ICCV), 2021.

Multi-Task Learning for Dense Prediction Tasks: A Survey.
Simon Vandenhende, Stamatios Georgoulis, Wouter Van Gansbeke, Marc Proesmans, Dengxin Dai, Luc Van Gool
IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2020.

SCAN: Learning to Classify Images Without Labels.
Wouter Van Gansbeke*, Simon Vandenhende*, Stamatios Georgoulis, Marc Proesmans, Luc Van Gool
European Conference on Computer Vision (ECCV), 2020.

Don't Forget The Past: Recurrent Depth Estimation from Monocular Video.
Vaishakh Patil, Wouter Van Gansbeke, Dengxin Dai, Luc Van Gool
IEEE Robotics and Automation Letters (R-AL), 2020.

Sparse and Noisy LiDAR Completion with RGB Guidance and Uncertainty.
Wouter Van Gansbeke, Davy Neven, Bert De Brabandere, Luc Van Gool
International Conference on Machine Vision Applications (MVA), 2019.

EXPERIENCE

Research Intern AI
Meta - Facebook AI Research

June 2022 – Sept. 2022
Menlo Park, California - U.S.

- Weakly supervised part segmentation: Achieved 95% of the performance of the supervised counterpart with 5-10 annotated points per part.
- Large scale self-supervised instance segmentation: Achieved 50% relative improvement w.r.t. state-of-the-art.
- Programming/Tools: Python, GNU-Linux, Vim, Pytorch

Computer Vision Researcher
KU Leuven - TRACE

Sept. 2018 – Present
Leuven, Belgium

- R&D project "TRACE : Toyota Research on Automated Cars in Europe"
- Research self-supervised learning for autonomous driving applications
- Focus: semantic segmentation, depth estimation, anomaly detection
- Programming/Tools: Python, C++, CUDA, GNU-Linux, Vim, Pytorch

Master Thesis Student in Collaboration with Toyota
KU Leuven - TRACE

Sept. 2017 – June 2018
Leuven, Belgium

- Developed and implemented computer vision algorithms for the autonomous driving pipeline
- Focus: Real-time scene understanding (incl. instance segmentation, depth estimation and multi-task learning)
- Programming/Tools: Python, GNU-Linux, Vim, Pytorch

Software Engineer, Intern
Nokia

June 2017 – August 2017
Antwerp, Belgium

- Reduced time-to-market by automatically converting an object-oriented programming language to hardware
- Developed an efficient cross-talk-preventing algorithm for an FPGA using C++ with High-Level Synthesis
- Programming/Tools: C++, GNU-Linux, Vim

OTHER PROJECTS

Summer 2019   Kaggle Challenge: Open Images - Instance Segmentation

ORGANIZING WORKSHOPS

10/2021   Co-organizing the workshop "Deep Multi-Task Learning in Computer Vision (DeepMTL)" with S. Vandenhede, S. Georgoulis, D. Dai and L. Van Gool at **ICCV** [Website Workshop].

MEDIA - RESEARCH COMMUNITY

05/2020   Our ECCV 2020 paper received attention from the research community.
The community made blog posts [1], [2], [3] and a detailed explanation video [4] with more than 30k views.

TEACHING EXPERIENCE

Teaching responsibilities include designing exercise sessions and grading assignments.

Spring 2021   Image Analysis and Understanding (B-KUL-H09J2A)
Spring 2020   Digital Electronics and Processors (B-KUL-H01L1A)
Spring 2019   Digital Electronics and Processors (B-KUL-H01L1A)

TALKS

12/2021   Poster talk at NeurIPS
10/2021   Poster talk at ICCV
08/2020   Poster talk at ECCV
07/2020   *Decoupling representation learning and clustering for unsupervised image classification*
Computer Vision Seminar at ESAT-PSI, Leuven
07/2019   Presented my ongoing research during the poster session on self-supervised learning
International Computer Vision Summer School (ICVSS), Sicily
04/2019   *Sparse depth completion for autonomous vehicles*
Computer Vision Seminar at ESAT-PSI, Leuven

REVIEWING

Reviewer for ECCV 2022 (Outstanding Reviewer Award), CVPR 2022, IJCV 2022, ICCV 2021, CVPR 2021, R-AL 2021.

Skills

Programming Languages: Python (main), C++, Java, MATLAB, Bash, MySQL, Verilog
Python Packages: Pytorch, Scikit-learn, Pandas, NumPy, Matplotlib, Joblib
Tools: GNU-Linux, Vim, Git, Latex, Condor (main), Slurm
Computer Science: Data Structures, Algorithms, Object-Oriented Programming, Linear Algebra
Languages: English (fluent), French (intermediate), Dutch (mother tongue)