

Lasse Laursen

COMPUTER VISION · DEEP-LEARNING · HUMAN-COMPUTER INTERACTION (HCI)

Berlin, Germany

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Degrees B.Sc., M.Sc., Ph.D, and Post-doc in Computer Science and Human-Computer Interaction

Techs C/C++23, Python, TensorFlow, TensorRT, TypeScript/JavaScript, Vue 3

Spoken Languages English, German, Danish, Swedish

Summary

R&D Software Engineer Lead specializing in Computer Vision and end-to-end system architecture. Experienced across commercial and academic environments, delivering production-grade vision systems from research to deployment. Published author in peer-reviewed venues. Passionate about translating cutting-edge research into robust, real-world applications while mentoring high-performing engineering teams.

Work Experience

Apple Inc. — Contractor (via IventIM)

Munich, Germany

LEAD ENGINEER

July 2024 - Feb. 2026

- Developing computer vision algorithms for depth reconstruction, optical correspondence search, and disparity-based 3D imaging pipelines, used to quality control manufacturing.
 - Implementing coarse-to-fine epipolar search strategies achieving 90% reduction in runtime with less than 1% average loss of accuracy.
 - Architected real-time Python-based calibration tool processing 150MP sized images to focus prototype cameras using OpenCv.
 - Quantitative evaluation of depth reconstruction performance against 'known' virtual scene ground-truth.
- Designing and implementing a cross-platform C/C++ SDK following the Hourglass architecture pattern, including Python bindings via pybind11 to provide depth reconstruction functionality to other internal teams.
- 20 technical interviews and assessments of C++/Python mid and senior candidates.

Self-Employed

Berlin, Germany

RESEARCHER AND DEVELOPER

Mar. 2023 - July 2024

- Developing and releasing second generation of PlanMixPlay, a real-time audio & visual performance software: PlanMixPlay.com
 - Incorporating Deep-Learning driving technologies for offline lyric detection and online beat/downbeat detection.
 - Developing back-end in C++20 and front-end graphical user-interface via Chromium Embedded Framework running Vue 3 on HTML/CSS and TypeScript.
 - Designing and implementing 'Tracks on a Timeline' editing interface allowing for direct interaction of audio and visual elements during playback.
 - Implemented templated C++ to JavaScript bridging code hiding communication complexities while ensuring type safety.
- Developing and releasing LyricManager: lasselaursen.com/projects/lyric-manager/
 - Designing multi-stage lyric text to vocal alignment, starting with machine learning model to classic matching algorithm resulting in +90% accuracy for most songs.
 - Developing both command-line and GUI interfaces using same back-end code path to ensure identical run-time behavior.

Shield AI (formerly Sentient Vision Systems)

Melbourne, Australia

RESEARCH & DEVELOPMENT TOOLS LEAD

Dec. 2021 - Mar. 2023

- Trained Maritime ViDAR's first CNN Heatmap-based classification network.
- Led development of re-designing Sentient's ViDAR-detection-software quantitative evaluation tool. A corner-stone of the quality assurance protocol used to verify performance of all commercial visual detection software prior to customer release.

MARITIME ViDAR PRODUCT LEAD

Aug. 2020 - Dec. 2021

- Built Python-based in-house Data API, accessing 1.7 million frames of 3000+ Terabytes, used to train all Maritime ViDAR CNN models.
- Supported product demonstration in Belgium involving rescue operation of 24 migrants in the English channel: vimeo.com/650993928
- Spearheaded evaluation and integration of Python unit-testing Framework: Pytest.
- Maintained product feature road-map to ensure positive outcomes in future Maritime ViDAR releases.
- Defined CMake build guidelines.
- Defined Python coding style-guide.

DEEP LEARNING TEAM LEAD

May. 2019 - Aug. 2020

- Developed TensorTruss, Sentient's Python/TensorFlow deep learning framework to train, test and export commercially deployed CNN models.
- Created Sentient's first commercial C++/TensorRT deep learning run-time library, executing exported CNN models in real-time on embedded hardware. This led to the first ever detection upgrade where true positives increased and both false positives and false negatives decreased.
- Established and upheld formal code review guidelines.

SENIOR SOFTWARE ENGINEER

Oct. 2018 - May. 2019

- Led comprehensive quantitative study of Maritime ViDAR, involving over 15 test flights in collaboration with the Australian coast guard.
- Automated C++ candidate testing framework, reducing evaluation time down from 2-3 days to 1 day. Used on over 100 candidates: lasselaursen.com/post/interviewing-engineers/

- Spearheaded evaluation and integration of C++ Unit-testing framework: GoogleTest.
- Implemented C++ software-based rendering pipeline to erase coastline-portion from ViDAR aerial photography.
- Refactored Qt Webkit-based front-end using C++/JavaScript to render real-time incoming target detections to ViDAR operator.

University of Tokyo

Tokyo, Japan

ACADEMIC SUPPORT SPECIAL STAFF

Sep. 2014 - May. 2015

- Authored peer-reviewed publication in Collaboration with Microsoft Research Cambridge: lasselaursen.com/projects/icon-set-selection/
- Conducted quantitative study with 2500 participants providing feedback to evaluate icon comprehensibility and identifiability.

POSTDOCTORAL FELLOW

Aug. 2012 - Aug. 2014

- Authored peer-reviewed publication on real-time C++ performance system: lasselaursen.com/projects/social-dj/
- Conducted two qualitative user studies with 7 DJs, including four 2-hour live shows with over 120 listeners.
- Developed novel C++11 based touch-based gesture detection for large-scale touch devices: lasselaursen.com/projects/tapdrag/
- Conducted quantitative user study with 18 participants published on Arxiv.

Education

DTU - Technical University of Denmark

Lyngby, Denmark

PH.D. IN COMPUTER SCIENCE AND HUMAN-COMPUTER INTERACITON

2009 - 2012

- Authored 3 internationally peer-reviewed published articles, and one technical article: lasselaursen.com/projects/virtual-cuts/
- Developed real-time OpenGL/GLSL GPU-based volumetric render algorithm of CT Scanned pig-data with 6 DOF haptic interaction.
- Conducted qualitative user study with 8 participants in collaboration with Danish Crown and Danish Technological Institute.
- Collaborated with foreign researchers in external stay at Tokyo University in Tokyo, Japan.

University of Copenhagen

Copenhagen, Denmark

M.Sc. IN COMPUTER SCIENCE AND HUMAN-COMPUTER INTERACITON

2005 - 2008

- Completed thesis on augmented reality-based computer board games: lasselaursen.com/projects/computer-aided-board-gaming/
 - Developed real-time C++ 3D Pose Estimation algorithm, with competitive results to OpenCV counterpart.
 - Conducted qualitative user study with 10 participants and determined key usability issues to address in future release.
- Collaborated in a production team of 12 to produce a total-conversion Half-Life Mod for the Danish Academy of Digital Interactive Arts: lasselaursen.com/projects/dolores/

University of Copenhagen

Copenhagen, Denmark

B.Sc. IN COMPUTER SCIENCE AND HUMAN-COMPUTER INTERACITON

2002 - 2005

Honors

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|------|--|---------------------|
| 2014 | Awarded , Microsoft Research Asia University Relations Grant | Tokyo, Japan |
| 2012 | Awarded , JSPS Postdoctoral Fellowship for Foreign Researcher | Tokyo, Japan |
| 2012 | Winner , SCCG '12 Best Presentation Award | Smolenice, Slovakia |
| 2009 | 1st Place , COGAIN Student Competition | Lyngby, Denmark |

Publications

Icon Set Selection via Human Computation

PACIFIC GRAPHICS '16: THE 24TH PACIFIC CONFERENCE ON COMPUTER GRAPHICS AND APPLICATIONS

2016

A Multi-Touch DJ Interface with Remote Audience Feedback

ACM MM '14: THE 22ND ACM INTERNATIONAL CONFERENCE ON MULTIMEDIA

2014

PorkCAD: Case study of the design of a pork product prototyper

IASDR '13: 5TH INTERNATIONAL CONGRESS OF INTERNATIONAL ASSOCIATION OF SOCIETIES OF DESIGN RESEARCH

2013

Registration-based interpolation real-time volume visualization

SCCG '12: PROCEEDINGS OF THE 28TH SPRING CONFERENCE ON COMPUTER GRAPHICS

2012

Anisotropic 3D texture synthesis with application to volume rendering

WSCG '11: WINTER SCHOOL OF COMPUTER GRAPHICS 2011

2011

GazeTrain: A case study of an action oriented gaze-controlled game

COGAIN '09: THE 5TH CONFERENCE ON COMMUNICATION BY GAZE INTERACTION

2009