

# Lasse Laursen

RESEARCH & DEVELOPMENT SPECIALIST IN DEEP-LEARNING, COMPUTER VISION, AND HUMAN-COMPUTER INTERACTION

Berlin, Germany

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

**Fields** Deep Learning, Computer Vision, Human-Computer Interaction, Usability

**Techs** C/C++20, Python, TensorFlow, TensorRT, TypeScript/JavaScript, Vue 3

**Spoken Languages** English, German, Danish, Swedish

## Summary

Research & Development Software Engineer Lead with extensive experience in both commercial and academic software development environments. Expertise in software architecture and developing applications from end-to-end including: design, engineering, testing, and deployment. Thrives on practical approaches to challenging problems. Adept at fostering strong interpersonal relationships within the workplace, mentoring and supporting colleagues to leverage their strengths and excel in their respective roles. Successfully published multiple papers in peer-reviewed publications.

## Work Experience

### Self-Employed

*Berlin, Germany*

RESEARCHER AND DEVELOPER

*Mar. 2023 - Present*

- Developing and releasing second generation of PlanMixPlay, a real-time audio & visual performance software: [PlanMixPlay.com](http://PlanMixPlay.com)
  - 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/](http://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.

### 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](https://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 training, testing and exporting commercially deployed CNN models.
- Created NeuralNetworkModelLoader, Sentient's C++/TensorRT deep learning run-time library, executing exported CNN models in real-time.
- 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 to 1 day from 2-3 days. Used on over 100 candidates: [lasselaursen.com/post/interviewing-engineers/](http://lasselaursen.com/post/interviewing-engineers/)

SOFTWARE ENGINEER

*Nov. 2016 - Oct. 2018*

- 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.

## Self-Employed

Hamburg, Germany

RESEARCHER AND DEVELOPER

Jun. 2015 - Oct. 2016

- Lead developer on PlanMixPlay, real-time audio/video performance software: [lasselaursen.com/projects/planmixplay/](http://lasselaursen.com/projects/planmixplay/)
  - Developed custom C++14 Graphical User Interface (GUI) using an integration tree to render complete user interface.
  - Developed real-time C++14 41-touch gesture detection engine reliably supporting Tap, Drag, and Pinch gestures.
  - Developed real-time C++14 audio playback-engine based on the BASS library.
  - Developed real-time OpenGL/GLSL media rendering engine supporting video playback and live rendered 3D visuals.
- Re-Launched [LasseLaursen.com](http://LasseLaursen.com) and [PlanMixPlay.com](http://PlanMixPlay.com) using PHP, Laravel, Eloquence, and MySQL.

## 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/](http://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/](http://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/](http://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/](http://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/](http://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/](http://lasselaursen.com/projects/dolores/)

### University of Copenhagen

Copenhagen, Denmark

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

2002 - 2005

## Honors

- 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 in 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