SSBAktuellt

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INNEHÅLL

Title photo: Andrea Behanova

June 2024

Ordförandes Ord

Amanda Berg

Kära medlemmar,

Syrenerna är överblommade och jordgubbarna mognar för fullt i landet. Nu är den snart äntligen här för de flesta av oss i alla fall, semestern! Ännu ett halvår har gått sedan senaste numret av SSBAktuellt. Mycket har hänt sedan dess, inte minst har ännu ett gäng doktorander framgångsrikt försvarat sina avhandlingar. Ta gärna en titt på listan under aktuella avhandlingar. Önskar er alla ett stort grattis och lycka till!

Aningen mer snö än nu var det i mars, då vi besökte Luleå för att delta i årets SSBA/SSDL symposium. Keynotes och presentationer höll hög klass och symposiena inbjöd, i vanlig ordning, till en hel del intressanta möten och diskussioner. En mer detaljrik beskrivning av SSBA/SSDL 2024 finns lite längre ner i det här numret. Det allra första symposiet jag deltog i var i Luleå för 10 år sedan, så för min egen del känns det som att cirkeln är sluten. Nästa år ses vi i Stockholm och det ser vi redan fram emot!

Förutom en symposierapport bjuder detta nummer bland annat på konferensrapporter från NeurIPS och CVPR, samt ett inlägg från en av våra företagsmedlemmar, Synteda. I höst är tanken att arrangera ännu en workshop, förmodligen under vecka 45. Mer information om det kommer på mail.

Jag önskar er en trevlig läsning i sommarvärmen. Hoppet lever än om en mindre regnig sommar än den förra.

June 2024, Sweden

A Word from the Editors
Call for SSBAktuellt Content

Dear SSBA Community,

We are approaching the end of another semester. Now, it is time for all of us to get some sun, relax, and enjoy the summer. We also wanted to take this opportunity to invite you all to contribute your ideas and engaging content, such as conference reports, internship experiences, and more, for inclusion in the upcoming issues of SSBAktuellt. Feel free to reach out to us at redaktionen@ssba.org.se with your suggestions.

Kind Regards,
SSBAktuellt Redaktionen

Bao-Long   Andrea   James

A Word from the Editors
Call for SSBAktuellt Cover Images

Do you have photos, images or graphics you would like to share with SSBA community that would fit the SSBA newsletter? Images connected to Sweden, your research, SSBA activities or graphics which relate to image analysis are all welcome! Please send your proposal to redaktionen@ssba.org.se.
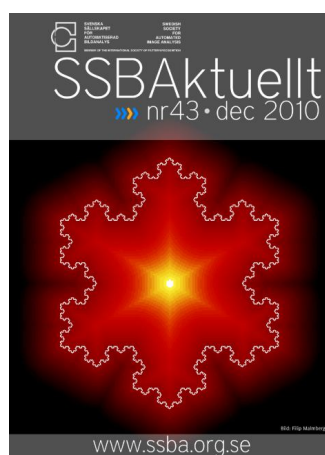
SSBA/SSDL 2024

The SSBA/SSDL 2024 symposium was held at Luleå University of Technology from March 11-13, 2024. It brought together leading experts in image analysis and deep learning. The event was marked by keynote addresses, research presentations, and engaging discussions, emphasizing the synergy between academia and industry. A total of 105 participants with 28 different affiliations attended, 66 of whom were students.

On the first day Symposium chair Marcus Liwicki's set the stage during the Doctoral Day with an inspiring talk on LTU's mission and the pioneering research conducted by the machine learning group. He also offered insights on PhD studies, fostering an exchange of ideas among scholars. Homam Mokayed's highlighted the integration of academic research in vehicle intelligence systems with industrial applications, focusing on traffic prediction, driver awareness, and vehicular data mining.

The first of three keynotes was delivered by Seiichi Uchida, Distinguished Professor from Kyushu University "'Beyond 100%' - Open Research In Document Analysis." Uchida discussed the innovative research in his lab, particularly in analysis of fonts. In the tour of the AI and Robotics Lab participants experienced cutting-edge technologies, gaining insights into the ongoing transformative research initiatives.

The afternoon included the Poster Session. This was preceded by short pitches in the main lecture hall by each author to make sure that everyone at least saw something about each poster. The poster session provided a platform for researchers to showcase their projects, facilitating discussions and knowledge exchange.

The evening included the annual SSBA Administrative meeting. Events from the past year and plans for the future were discussed. The budget was reviewed and new board members were selected. Everyone is encouraged to become a member of SSBA and participate in its organization.
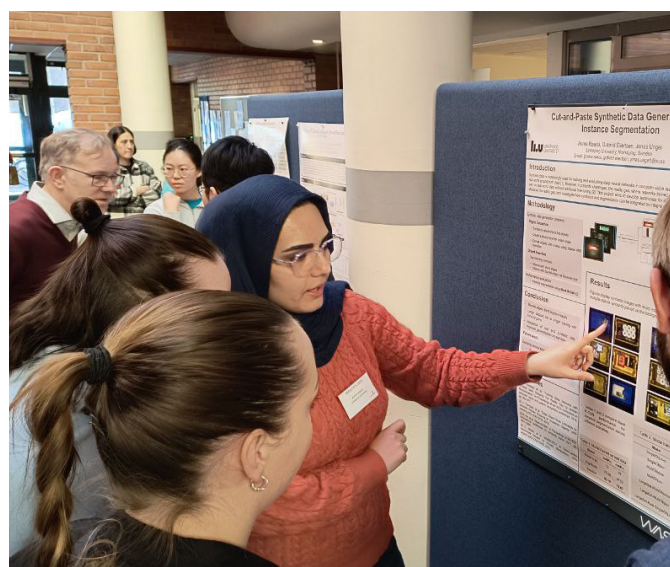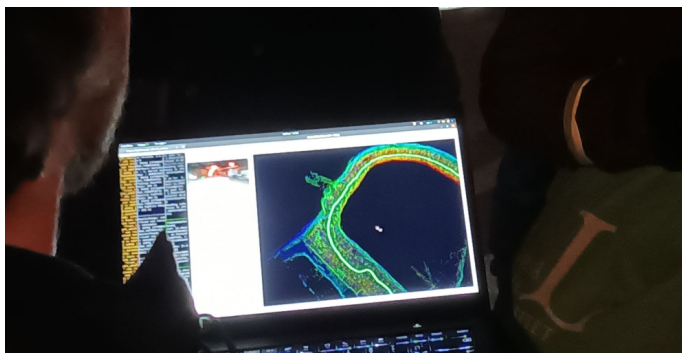
The second day started with a keynote by Ida Häggström "Diagnosis and Prognostication in Medical Imaging Using AI." Focused on machine learning applications in medical imaging, particularly for cancer diagnosis and prognostication, emphasizing survival modeling techniques. The rest of the morning included five oral paper presentations on diverse topics including scene recovery, text recognition, neural radiance fields for 3D reconstruction, and adaptive sampling techniques.

After lunch Elisa Barney delivered the symposium's third keynote: "Historical Document Analysis and the Humanities." She explained how document analysis can be used for interdisciplinary applications, bridging research and humanities.

The new "Bring your own Problem" session allowed attendees to introduce new ideas they have come across, which the community would benefit from exploring in the future as the field develops and grows. The afternoon concluded with a visit to the Mjölkluddsberge and the LTU Underground Mining Lab. We traded our chairs for a short brisk walk to the nearby tunnel where we saw a demonstration of the use of robots in hazardous environments.

The day ended with a Celebratory Dinner and Awards. Outstanding industry-focused research contributions were acknowledged. Symposium participants also had the opportunity to explore the exhibits at Teknikens Hus science museum. Our afternoon exercise walking to the mining tunnel was rewarded by extra beverages alongside our dinner.

The final day started with Robert Jenssen's Keynote: "XAI For Representation Learning." Robert discussed eXplainable AI (XAI) and the RELAX framework, highlighting advancements in representation learning. Six more oral presentations covered AI applications in medical imaging and federated learning.

After lunch the symposium concluded with an Industrial Panel Discussion. This addressed AI adoption challenges in Sweden, focusing on ethics, uncertainty, and legal issues.

We feel the SSBA/SSDL 2024 symposium was a resounding success, featuring insightful discussions, groundbreaking research, and invaluable networking opportunities, setting the stage for future advancements in image analysis and deep learning. We hope you agree and will put the 2025 symposium to be held in Stockholm in March 2025 on your calendar.

The Author

Elisa Barney
Professor of Machine Learning
Luleå University of Technology

CVPR 2024

Johannes Hägerlind reports on the Conference on Computer Vision and Pattern Recognition that took place in Seattle in June 2024.

CVPR 2024 took place at the Seattle Convention Center in the United States. Sweden was well-represented at the conference, and I met attendees from KTH, Lund, Chalmers, and Linköping, as well as several former PhD students from Linköping.

The first two days were filled with workshops and tutorials, while the main conference spanned the last three days. During the main conference, there were poster presentations, and a selection of accepted papers were presented orally.

One interesting oral presentation was "Seeing the World through Your Eyes" by Hadi Alzayer et al. They used eye reflections from multiple images to perform 3D reconstruction. However, their method relies on a setup that maximizes reflections in the subject's eyes and works best with brown eyes, according to the presenter. Another notable oral presentation was "Steerers: A Framework for Rotation Equivariant Keypoints" by Georg Bökman et al., which introduced a method for rotation-invariant image matching.

This was my first major conference experience. CVPR feels both large and small: large in the sense that it's impossible to attend all the talks you're interested in, and small in the sense that you frequently encounter renowned researchers. Some might be the very people behind an engaging computer vision lecture on YouTube. I was even unknowingly talking with the primary author of a paper that forms the foundation of my own research. This unique blend is likely due to the specialized focus on computer vision.
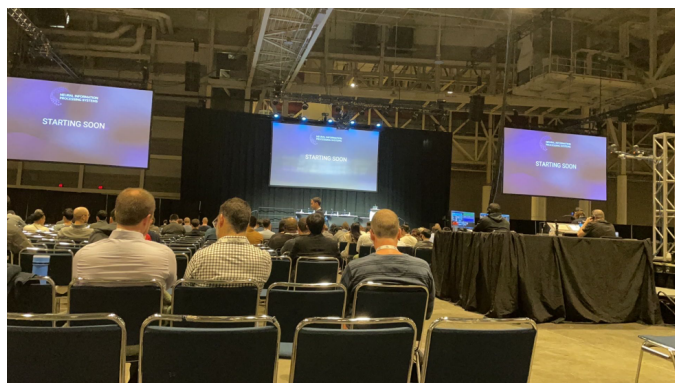
On the evening of the last day of the conference, some of us visited the Space Needle. We were fortunate to have clear skies, allowing us to see the 4,392-meter peak of Mount Rainier in the distance.

The Author

Johannes Hägerlind
PhD student
CVL, Linköping

NeurIPS 2023

The Neural Information Processing Systems (NeurIPS) 2023 conference, held in December, at the Vancouver Convention Center, New Orleans, was a landmark event in the AI research calendar. The conference drew over 16,000 attendees from around the globe and featured a record-breaking 13,330 paper submissions.

The NeurIPS 2023 conference highlighted several key topics and advancements in machine learning and AI, spanning diverse areas such as language models, reinforcement learning, neural network optimization, and more.

To follow the latest trend in Machine Learning, checkout Outstanding Main Track Papers:
Privacy Auditing with One (1) Training Run (https://neurips.cc/virtual/2023/poster/70925)
Are Emergent Abilities of Large Language Models a Mirage? (https://neurips.cc/virtual/2023/poster/72117)

If you're interested in experiencing the unique natural beauty of New Orleans, there are several swamp and bayou tour options available. These tours typically take you through the Louisiana wetlands, providing opportunities to see wildlife like alligators, birds, and other native species up close.

Enjoying jazz in New Orleans is a must-do experience, as the city offers a rich array of venues and events that celebrate its storied musical heritage. The origins of jazz can be traced back to the culturally rich city of New Orleans in the late 19th and early 20th centuries. This musical genre emerged from a unique blend of African, Caribbean, and European musical traditions, influenced heavily by the city's diverse cultural heritage.
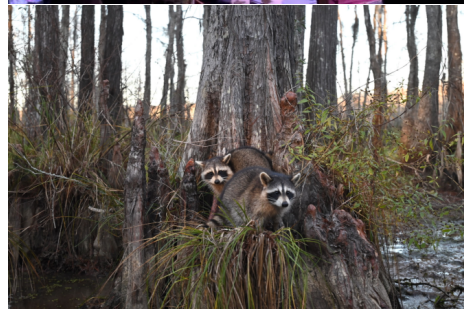
The Author

Yushan Zhang
PhD student
CVL, Linköping

Event Report

Centre for Image Analysis Day

Uppsala, Sweden — On May 21, 2024, Uppsala University's Ångström Laboratories hosted the annual CBA Day, organized by the Centre for Image Analysis. The event attracted a diverse group of researchers, academics, and industry professionals, all eager to explore the latest advancements in image analysis technology.

The day began with a compelling opening address by Nataša Sladoje, Director of the Centre for Image Analysis, who underscored the importance of interdisciplinary collaboration in advancing the field. Her words set an inspiring tone for a day filled with knowledge sharing and innovative presentations.

A series of engaging oral presentations highlighted the event. Johan Wikström captivated the audience with his discussion on how image analysis is revolutionizing radiology. Sophie Sanchez's presentation on 3D virtual histology provided fascinating insights into the secrets of bones, while Tobias Sjöblom discussed the automated evaluation of CT pulmonary angiography images, showcasing advancements in medical imaging that could improve diagnostic accuracy and patient care. Orcun Göksel's talk on imaging applications in MedTech and Ingela Nyström's discussion on making the invisible visible through InfraVis further demonstrated the diverse applications of image analysis.

Interactive poster sessions and software demonstrations were highlights of the day. Researchers and attendees engaged in lively discussions about their projects, exploring practical applications of new software tools and methodologies. These sessions provided a valuable platform for networking and collaborative brainstorming, sparking ideas for future research directions.

CBA Day 2024 concluded with a reflective session where attendees shared their insights and experiences from the day. The event was widely regarded as a success, having facilitated meaningful exchanges of ideas and forged new connections among researchers. The event not only highlighted significant research achievements but also facilitated meaningful interactions and potential collaborations among participants. Researchers left with renewed inspiration and valuable connections, eager to push the boundaries of image analysis further.

The Author

Andrea Behanova
PhD student
Uppsala Univeristy

Internship Report
University of Central Florida

My Empowering Research Experience at Center for Research on Computer Vision, University of Central Florida.

As a doctoral researcher focusing on the computer vision domain, I recently embarked on a three-month research visit at the Center for Research in Computer Vision (CRCV) at the University of Central Florida. Guided by the renowned Prof. Mubarak Shah, I explored geo-localization and robust representation learning in vision, uncovering insights that drive my research forward.

This visit transformed my research journey. I didn't just improve my technical skills; I lived the dynamic and collaborative research culture of the United States. Working with the excellent researchers at CRCV every day pushed my understanding and skills to new heights.

Florida itself was a vibrant backdrop to this academic journey. I soaked in the local culture, made wonderful new friends, and found that living there enriched my experience in many ways.

This journey didn't just shape my present—it lit up my future. By blending my past industrial R&D work with topped-up cutting-edge academic research, I feel more prepared than ever to make meaningful contributions to the computer vision domain. I'm excited to take this experience with me as I continue my doctoral research and explore new career opportunities shortly.

The Author

Prakash Chandra Chhipa
Doctoral Researcher at Machine Learning Group
Luleå University of Technology

Project Report

AI4Edu, AI Assisstant

The AI4Edu project, led by Dr Homom Mokayed at LTU, developed a Conversational AI assistant for teaching and learning. It is an Erasmus+ Forward-looking project funded by the European Commission, European Education and Culture Executive Agency (EACEA). This ambitious initiative is set to transform education using cutting-edge artificial intelligence. This project unites AI experts, educators, and policymakers to develop adaptive learning environments, provide real-time feedback, and support teachers in their pedagogical efforts. AI4Edu emphasizes ethical AI use and inclusivity, aiming to bridge educational gaps across Europe.

Main Outcomes
- Conversational Educational Assistants: Development and evaluation of tools like "Study Buddy" for students, enhancing self-study and school preparation, and "Teacher Workmate" for teachers, supporting teaching and assessment activities.
- AI-Human Collaboration: Investigating AI adoption in real educational settings, evaluating AI4Edu's impact on learning and teaching, and producing evidence-based recommendations and policy guidelines for ethical, inclusive, and equitable AI deployment.
- Learning About AI: Providing hands-on learning experiences about AI systems, making core AI components of AI4Edu applications available for student experimentation, showcasing AI systems' strengths, limitations, and biases.

Pedagogical Approaches
AI4Edu focuses on student-centered, inquiry-based, dialogic, and scaffolding education, ensuring that AI supports diverse learning styles and needs. The project envisions AI acting as a tutor, coach, mentor, and teammate, enhancing the educational experience comprehensively.

Project Plan
- Specify Subjects and Grades: Identifying target areas such as biology and social sciences across various educational levels.
- Data Collection and Brainstorming: Conducting workshops with 146 students and 141 teachers across four countries to gather qualitative and quantitative data.
- Tool Development: Creating AI tools like "Study Buddy" and "Teacher Mate" to support personalized and effective learning.
- Evaluation and Tuning: Iterative testing and refinement of the AI tools based on feedback and performance metrics.
- Final Release: Implementing the polished tools in educational settings.

AI4Edu's consortium includes:
- Greece: ARC Center and Ellinogermaniki Agogi School
- Sweden: Luleå University of Technology (LTU)
- Cyprus: University of Cyprus, Paidagogiko Institouto Kyprou
- Ireland: Drumcondra Education Centre

Future Prospects
AI4Edu aims to set new standards in educational technology, paving the way for a more personalized, efficient, and inclusive education system across Europe. For more information, visit the project website at AI4Edu.eu

The Author

Hamam Mokayed
Senior Lecturer
Luleå University of Technology

Company Report

Synteda

Synteda AI's voyage commenced in Gothenburg, delivering IT services, and earning its status as a reliable industry ally. The company has consistently demonstrated its commitment to innovation and excellence through the development of a diverse range of products. From the beginning, Synteda has dedicated itself to creating solutions that address the evolving needs of various industries. Each product developed reflects its deep understanding of technology and its potential to transform operations.

Synteda AI's growth continued with the integration of Unibase, a strategic collaboration that enhanced the team of subject matter experts and diversified the portfolio, providing top-notch services across diverse domains. This move further solidified its position as a premier provider of tailored solutions. The company's expansion was further bolstered by the inclusion of LuunaX, which not only expanded its team of experts but also extended its reach in offshore and software development services. This strategic move allowed a wider client base and leveraged expertise to deliver exceptional results on a global scale. Together, Synteda AI, Unibase, and LuunaX formed the Synteda

Group, marking a new era of comprehensive service offerings and increased market presence.

Synteda Group takes pride in being at the forefront of innovation, driven by strategic partnerships, pioneering research projects, and a commitment to customer satisfaction. Helping businesses harness AI and computer vision is a core specialty. Synteda Group offers innovative, customized solutions that empower organizations to unlock the full potential of these transformative technologies. Close collaboration with SERT, HightFive, and Sweden's leading universities like Blekinge Institute of Technology, Chalmers, and Halmstad enables the company to provide cutting-edge insights and solutions across various industries.

Synteda Group is currently collaborating with its academic partner, Blekinge Institute of Technology, on a project to develop an easy-to-use solution for Generative AI-driven Graphical User Interface testing. The aim is to use cutting-edge AI models and integrate them intoa state-of-the-art GUI testing tool to innovate, realize, evaluate, and release a novel solution that makes advanced testing more accessible and efficient.

Additionally, Synteda Group is working on Be-Metrics, a comprehensive location analytics platform designed to enhance customer experiences and optimize facility management. By analysing visitor behaviour, foot traffic, and dwell time, it provides actionable insights for better decision-making.

The company is also in the process of developing a sophisticated recruitment system that utilizes machine learning and LLM to optimize workflow and enhance productivity. This system is designed to streamline the complex process of talent acquisition.

Synteda Group's "dream-innovate-create" approach ensures every idea undergoes rigorous scrutiny and testing, using agile methodologies to refine concepts into fully developed products. This guarantees that each solution is meticulously designed to meet the unique challenges of its clients. By blending strategic partnerships, a customer-centric approach, and technological expertise, Synteda Group enables businesses to flourish through the power of AI. The company is dedicated to infusing each project with the latest technological innovations, ensuring that every solution delivered is marked by both excellence and value.

Outlook 2024

Upcoming Conferences

JULY

Medical Imaging with Deep Learning (MIDL)
https://2024.midl.io/
July 3-5, 2024 - Paris, France

4th International Conference on Pattern Recognition and Artificial Intelligence (ICPRAI)
http://icprai2024.org/
July 3-6, 2024 - Jeju Island, South Korea

5th International Conference on Deep Learning Theory and Applications
https://delta.scitevents.org/
July 10-11, 2024 - Dijon, France

9th International Conference on Image, Vision and Computing (ICIVC)
http://www.icivc.org/
July 15-17, 2024 -Suzhou, China

14th International Conference on Pattern Recognition Systems
http://www.icprs.org
July 15-18, 2024 - London, UK

International Conference on Machine Learning (ICML)
https://icml.cc/
July 21-27, 2024 - Vienna, Austria

AUGUST

18th International Conference on Document Analysis and Recognition
https://icdar2024.net/
August 30-September 4, 2024 - Athens, Greece

OCTOBER

27th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
https://conferences.miccai.org/2024/en/
October 6-10, 2024 - Marrakesh, Morocco

IEEE International Conference on Image Processing (ICIP)
https://2024.ieeeicip.org/
October 27-30, 2024 - Abu Dhabi, UAE

NOVEMBER

26th Iberoamerican Congress on Pattern Recognition (CIARP)
http://ciarp24.org/
November 26-29, 2024 - Talca, Chile

DECEMBER

27th International Conference on Pattern Recognition (ICPR)
http://icpr2024.org/
December 1-5, 2024 - Kolkatta, India

JANUARY

Northern Lights Deep Learning Conference (NLDL)
https://www.nldl.org/
January 7-9, 2025 - Tromsø, Norway

FEBRUARY

14th International Conference on Pattern Recognition Applications and Methods (ICPRAM)
https://icpram.scitevents.org/
February 23-25, 2025 - Porto, Portugal

5th International Conference on Robotics, Computer Vision and Intelligent Systems
https://robovis.scitevents.org/
February 25-27, 2025 - Porto, Portugal

20th International Conference on Computer Vision Theory and Applications (VISAPP)
https://visapp.scitevents.org/
February 26-28, 2025 - Porto, Portugal

Winter Conference on Applications of Computer Vision (WACV)
https://wacv2025.thecvf.com/
February 28-March 4, 2025 - Tucson, US

APRIL

International Symposium on Biomedical Imaging (ISBI)
https://biomedicalimaging.org/2025/
April 14-17, 2025 - Houston, US

International Workshop on Biometrics and Forensics (IWBF)
https://www.unibw.de/bioml-en/news/ieee-iwbf-2025-in-munich
April 24-25, 2025 - Munich, Germany

International Conference on Learning Representations (ICLR)
https://iclr.cc/
April 24-28, 2025 - Singapore

JUNE

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)
https://www.thecvf.com/
June 10-17, 2025 - Nashville, Tennessee

Conference Announcement

ICPR 2024

ICPR 2024 is the flagship conference of IAPR, the International Association of Pattern Recognition. Professionals working in computer vision, image, sound, speech, pattern recognition, and machine intelligence can update their knowledge and sharpen their skills in all subspecialties of pattern recognition.

ICPR 2024 will be held Kolkata, India.
For more information, please visit:
https://icpr2024.org/

General topics of interest:
- Artificial intelligence, Machine Learning for Pattern Analysis
- Computer Vision, Robotics and intelligent Systems
- Image, Speech, and Signal Analysis
- Biometrics, Human Analysis and Behavior Understanding
- Document and Media Analysis
- Biomedical Image Analysis and Informatics

Conference Announcement
NLDL 2025

Deep learning is an emerging subfield in machine learning that has in recent years achieved state-of-the-art performance in image classification, object detection, segmentation, time series prediction and speech recognition to name a few. This conference will gather researchers both on a national and international level to exchange ideas, encourage collaborations and present cutting-edge research.

Submission deadlines:
  * Papers: September 02, 2024
  *Abstracts: October 20, 2024

More info: https://www.nldl.org/

Announcement

Aktuella Avhandlingar

Här presenteras de avhandlingar som publicerats sedan senaste numret av SSBAktuellt och kommit redaktionen till känna. Meddela redaktionen om aktuella avhandlingar

Deneb Boito
Linköpings universitet
Diffusion MRI with generalised gradient waveforms: methods, models, and neuroimaging applications

Johan Jönemo
Linköpings universitet
Deep learning on large neuroimaging datasets

Yue Liu
KTH
Breast cancer risk assessment and detection in mammograms with artificial intelligence

Doktorsavhandlingar

Lukas Brynte
Chalmers tekniska högskola
Learning and Optimizing Camera Pose

Erik Englesson
KTH
On Label Noise in Image Classification: An Aleatoric Uncertainty Perspective

Raphaela Heil
Uppsala Universitet
Document Image Processing for Handwritten Text Recognition: Deep Learning-based Transliteration of Astrid Lindgren's Stenographic Manuscripts

Philip John Harrison
Uppsala Universitet
Deep learning approaches for image cytometry: assessing cellular morphological responses to drug perturbations

Ankit Gupta
Uppsala Universitet
Adapting Deep Learning for Microscopy: Interaction, Application, and Validation

Karl Bengtsson Bernander
Uppsala Universitet
Equivariant Neural Networks for Biomedical Image Analysis

Axel Andersson
Uppsala Universitet
Computational Methods for Image-Based Spatial Transcriptomics