Thijs Kooi

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Education

- Ph.D. in computer science, Radboud University Nijmegen.
  Thesis: *Computer aided diagnosis of breast cancer in mammograpy using deep neural networks*
- M.Sc. in artificial intelligence, University of Amsterdam. *(Cum Laude)*
  Thesis: *Rigid surface tracking for spatial augmented reality*
- B.Sc. in artificial intelligence, University of Groningen.
  Thesis: *Region enhanced neural Q-learning in partially observable Markov decision processes*

Work experience

- 2020 - **VP of AI research** - Lunit, Seoul, South Korea
  I am resonsible for the R&D of the Lunit INSIGHT products (INSIGHT CXR, INSIGHT MMG and INSIGHT DBT) which includes algorithm design, implementation and management of software for deep learning algorithms, verification and evaluation of algorithms, regulatory document writing, scientific research, hiring and team management.
- 2017 - 2020 **Machine intelligence engineer/Head of R&D** - Vara, Berlin, Germany
  We built a CE certified triaging solution for screening mammography from scratch. I was responsible for design and implementation of deep learning algorithms, data collection and annotation, train and test set composition, statistical analysis,clinical evaluation, fund raising and setting up academic collaborations. The tool obtained CE 2b certification and two research grants were awarded for a total of 1.4 million EUR.
- 2013 - 2017 **Ph.D. student** Department or Radiology, RadboudUMC, Nijmegen, The Netherlands.
  My thesis was supervised by Prof. Dr. Nico Karssemeijer. We developed methods to detect breast cancer in mammography. My approach improved upon an algorithm that was considered state-of-the art for several decades and has led to high impact publications.
- 2016 **Visting Ph.D. student** - Department of Computer Science, Johns Hopkins University, Baltimore, United States
- Oct 2012 - April 2013 **Researcher** - Department of Machine Learning/A*STAR Bioinformatics institute, NUS, Singapore
- January 2012 - August 2012 **Visiting scholar** - Department of Computer Science, Keio University, Tokyo, Japan

Other activities

I reviewed papers for IEEE Transactions on Medical Imaging, Elsevier Medical Image Analysis, the SPIE Journal of Medical Imaging, Medical Physics, JAMA oncology, Nature scientific reports, Nature digital medicine, MICCAI and worked as an associate editor for Medical physics. I worked as a teaching assistent for introductory computer science and computational linguistics courses at University of Groningen and a course on computer aided diagnosis at RadboudUMC. I co-organized the first CIFAR Workshop on Deep learning in Medical Imaging in Amsterdam and organized a tutorial on AI applied to medical image analysis at MICCAI in 2022.

Selected publications

- *Lee, H.*, *Kim, J.*, *Park, E.*, *Kim, M.*, *Kim, T.*, and *Kooi, T.* (2023). Enhancing Breast Cancer Risk Prediction by Incorporating Prior Images. MICCAI Vancouver 2023.
- *Lee, W.*, *Lee, H.*, *Lee, H.*, *Park, E. K.*, *Nam, H.*, and *Kooi, T.* (2023). Transformer-based Deep Neural Network for Breast Cancer Classification on Digital Breast Tomosynthesis Images. Radiology: Artificial Intelligence, 5(3), e220159.
- *G. Litjens*, *T. Kooi*, *B. Ehteshami Bejnordi*, *A. Setio*, *F. Ciompi*, *M. Ghafoorian*, *J. van der Laak*, *B. van Ginneken*, *C. Sánchez* - A Survey on Deep Learning in Medical Image Analysis, Medical Image Analysis, 2017
- *T. Kooi*, *G. Litjens*, *B. van Ginneken*, *A. Gubern-Merida*, *C. Sanchez*, *R. Mann*, *A. den Heeten* and *N. Karssemeijer* - Large Scale Deep Learning for the Classification of Mammographic Lesions - Medical Image Analysis, 2017
- *T. Kooi*, *B. van Ginneken*, *A. den Heeten* and *N. Karssemeijer* - Discriminating Solitary Cysts from Soft Tissue Lesions in Mammography using a Pretrained Deep Convolutional Neural Network - Medical Physics, 2017
- *T. Kooi*, *F. de Sorbier* and *H. Saito*. Colour Descriptors for Tracking in Spatial Augmented Reality, ACCV workshop on Detection and Tracking in Challenging Environments, Daejeon, Korea, 2012. (Master thesis)
- *M.A. Wiering* and *T. Kooi*. Region Enhanced Neural Q-learning for Solving Model Based POMDPs. International Joint Conference on Neural Networks, Barcelona, Spain, 2010. (Bachelor thesis)