Martijn P. A. Starmans

Assistant Professor AI for Integrated Diagnostics

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Consortia

Current:

Liver AI (LAI)
Co-initiator and lead

Sarcoma AI (SAI)
Co-initiator and lead

H2020 EuCanImage
WP Lead

H2021 EOSC4Cancer
WP Lead

RadioVal
External Advisor

EUCAIM
Partner

Past:

H2020 euCanShare

Experience

01/24 - Now **Assistant Professor** Erasmus Medical Center, Rotterdam, NL

With a joint appointment at the Radiology & Nuclear and Pathology departments, Martijn is heading the AI for Integrated Diagnostics (AIID) research line. The AIID group develops novel multimodal machine learning methods to develop quantitative biomarkers, focused on medical imaging and application in concology.

- **Collaboration and awards**: Martijn is involved in various working groups and is work package leader in the Horizon 2020 EuCanImage and Horizon 2021 EOSC4Cancer projects. He is initiator and receiptient of various (consortium) grants, including an NWO NGF AINed Perfonal Fellowship (2M), the Liver AI (LAI) consortium (NWO OTP 1M grant), the Sarcoma Artificial Intelligence (SAI) consortium (Hanarth Fonds 400k grant), a Health-Holland 1M TKI grant on incidental pulmonary embolism, and project lead of the Colorectal Liver Metastes AI (COLIMA) consortium (grant submitted). In these consortia, in total 51 clinical centers, companies, professional- and patient associations from 18 countries are united. Additionally, and he is external advisor of RadioVal.
- **MICCAI 2024 organization**: first ever Open Data Chair, initiator of the AFRICAI repository for medical imaging.
- **Trustworthy AI**: co-lead of the FUTURE-AI guideline on trustworthy and deployable AI.
- **Supervision**: 1 PostDoc, 9 PhD students, and 6 MSc students.

09/21 - 12/23 **PostDoc** Erasmus Medical Center, Rotterdam, NL

Extending the work of his PhD, Martijn's research focused on generalization of radiomics biomarkers (conventional and deep learning based) using automated machine learning and meta-learning. He worked on a variety of clinical applications (e.g. sarcoma, liver cancer, colorectal cancer, bladder cancer, melanoma, cardiomyopathy, neuroendocrine tumors, CRPS).

- **Management**: Co-developer of Imaging Office of department of Radiology and Nuclear Medicine.
- **Supervision**: 17 MSc students.

10/22 - 01/23 **Visiting Postdoctoral Researcher** University of Barcelona, Barcelona, Spain

Martijn visited the Artificial Intelligence in Medicine group, Department of Mathematics and Informatics, of Prof. Dr. Karim Lekadir to collaborate on AI for oncology imaging within the context of the EuCanImage and euCanSHare projects. Besides working on these projects, he collaborated with various group members the FUTURE-AI guiding principles, radiomics FAIRness, and deep learning FAIRness.

10/16 - 08/21 **PhD Candidate** Erasmus Medical Center, Rotterdam, NL

Thesis defended 1st of February 2022 "cum laude" with the title "Streamlined Quantitative Imaging Biomarker Development: Generalization of ra-

diomics through automated machine learning". Nominated for the Frederik Philipsprijs 2022 for Best Dutch Radiology PhD Thesis and made the top five.

- **Generalization:** Martijn's radiomics framework has been successful in finding biomarkers in over 17 clinical applications and is now being used in over 25 studies by colleagues, other researchers, and companies.
- **Open-science**: Released the software for all his studies open source (e.g. WORC radiomics toolbox) and a large public database of 930 patients
- **Supervision**: 26 MSc/BSc students.

06/16 - 08/16 **Internship** Philips Healthcare, Best, NL
Stitching of 2-D fluoroscopy images for fracture malalignment reduction.

09/15 - 04/16 **MSc Thesis** Quantitative Imaging, Delft University of Technology, Delft, NL
Deformable registration in 3D Breast Ultrasound scans.

Grants & Awards

2023 **Personal Fellowship** NWO NGF AINed
•Topic: Radiology and pathology join forces through Artificial Intelligence for Integrated Diagnostics (AIID)
•Total funding: 2M Euro.

2023 **Research Grant - co-applicant** ISIDORe JRA Programme
•Topic: PATH2XNAT: COVID 19 meets Pathomics meets XNAT
•Total funding: 280k Euro.

2023 **Research Grant - co-applicant**[1] NWO Open Technology Program
•Topic: The Liver Artificial Intelligence (LAI) consortium: a benchmark dataset and optimized machine learning methods for MRI-based diagnosis of solid appearing liver lesions.
•Total funding: 1M Euro.

2023 **Research Grant - co-applicant** Health-Holland TKI
•Topic: An artificial intelligence (AI)-based model for detection of incidental pulmonary embolism in chest CTs
•Total funding: 1M Euro.

2023 **Top 5 Philips Frederiksprijs** Dutch National society of radiologists
•Selected for top 5 Dutch Radiology thesis of the year.

2022 **Research Grant - partner** EU Horizon
•Topic: EUCAIM: European Federation for Cancer Images.
•Total funding: 33M Euro.

2021 **Open Research Award** Convergence Health & Technology

2020 **Research Grant - co-applicant**[1] Hanarth Fonds
•Topic: Automatic grading and phenotyping of soft-tissue tumors through

machine learning to guide personalized cancer treatment.
•Total funding: 400k Euro.

2019 **Employee of the Year** Department of Radiology and Nuclear Medicine, Erasmus MC
Honorable Mention

10/2017 **Challenge Winner** Colorectal liver metastases survival prediction challenge
Hosted at Medical Image Computing and Computer Assisted Intervention (MICCAI) 2017.

[1] Not officially mentioned as co-applicant due to formalities. Reference of formal applicant available upon request.

Education

09/14 - 08/16 **MSc Applied Physics** Delft University of Technology, Delft, NL
GPA: 8.0 / 10. Track: Imaging Physics, Specialization: Research and Development
Electives: Medical Imaging, Advanced Wave Propagation, Charged Particle Optics and Imaging Systems

09/14 - 08/16 **MSc Applied Physics Honours Track** Delft University of Technology, Delft, NL
GPA: 7.6 / 10. Track: Quantum Nanoscience
Electives: Applications of Quantum Mechanics, Electronics for Quantum Computing

09/10 - 08/13 **BSc Applied Physics** Delft University of Technology, Delft, NL
GPA: 7.6 / 10. Minor: Management in a high-tech environment, final project for Damen Shipyards, Thales Netherlands and Imtech (GPA: 8.0/10)

09/04 - 06/10 **High School** Gymnasium Felisenum, Velsen, NL
GPA: 8.2 / 10 (cum laude)

Teaching

2023 - now **Advanced Digital Image Processing** MSc Applied Physics, TU Delft
Teaching four guest lectures on Deep Learning in Medical Imaging, including help in examination.

2023 **Summer School on AI for Medical Imaging** AFRICAI / MICCAI
Part of program committee and mentor in this 1st AFRICAI / MICCAI summer school. Responsible for the Model Development 2: Model-Centric AI and Writing: Results sections.

2023 **Rotterdam Radiology Artificial Intelligence Course** Dutch Society of Radiology
Invited lecturer and panel member in this first edition of the course.

2020 - 2023 **Machine Learning** MSc Technical Medicine, TU Delft
Co-initiator and co-developer. Current tasks include giving lectures, supervising programming assignments, and examination.

2017 - 2023 **Advanced Image Processing** MSc Technical Medicine, TU Delft
Co-initiator and co-developer. Current tasks include giving lectures, supervising programming assignments, and examination.

2017 - 2023 **Image Processing** BSc Technical Medicine, TU Delft
Current tasks include giving lectures, supervising programming assignments, and examination.

Invited Presentations

D. J. Spaanderman† and **M. P. A. Starmans**, *Ai in medical imaging for soft tissue and bone sarcoma*, Invited keynote presentation at the annual Dutch Sarcoma Group (DSG) meeting, Utrecht, the Netherlands, May 2024.

M. P. A. Starmans†, *Ai and image analysis of liver metastases*, Invited keynote presentation at the Liver Metastases Research Network (LMRN) Annual Meeting 2024, Rotterdam, the Netherlands, Jun. 2024.

M. P. A. Starmans†, *Radiology and pathology join forces through artificial intelligence for integrated diagnostics (AIID)*, Invited keynote presentation at the annual Erasmus MC Cancer Retreat, Rotterdam, the Netherlands, May 2024.

M. P. A. Starmans†, *Radiology and pathology join forces through artificial intelligence for integrated diagnostics (AIID)*, Invited keynote presentation at the TIIM congress 2024, Utrecht, the Netherlands, May 2024.

M. P. A. Starmans†, *Technical considerations for the design and construction of trustworthy ai in multi-country oncology imaging*, Co-organizer and keynote speaker of EACR EuCanImage workshop, Rotterdam, the Netherlands, Jun. 2024.

S. Klein† and **M. P. A. Starmans**, *Liver AI research at Erasmus MC*, Invited presentation at the PHAIR Consortium kick-off, Dec. 2023.

M. P. A. Starmans†, *Ai and image analysis of liver metastases*, Invited keynote presentation at the Liver Metastases Research Network (LMRN) Annual Meeting 2023, Brussels, Belgium, Jun. 2023.

M. P. A. Starmans†, *EuCanImage: Towards a european cancer imaging platform for enhanced artificial intelligence in oncology*, Invited presentation at the European Congress of Radiology (ECR) 2023, Vienna, Austria, Mar. 2023.

M. P. A. Starmans†, *Zijn we dan artificieel intelligent met mammografie/mri*, Invited keynote presentation at this regional Breast Cancer meeting of Healthcare providers, May 2023.

M. P. A. Starmans†, *Current status and future outlook on artificial intelligence in radiological imaging for liver metastases*, Presented at the Liver Metastases Research Network (LMRN) Annual Meeting 2022, Sheffield, UK, Jun. 2022.

M. P. A. Starmans†, *Eucanimage data platform and catalogue for cancer imaging and non-imaging data*, Presented for the RadioVal Consortium, Nov. 2022.

M. P. A. Starmans†, *Technical and organizational obstacles and solutions for a secure data platform in cancer imaging*, Presented at the EuCanImage Webinar 2022. Additionally panalist in three sessions of the four (sharing, anonimization, and annotation), Nov. 2022.

M. P. A. Starmans†, *Multicentre studies for more robust radiomics signatures*, Presented at the European Congress of Radiology (ECR) 2021, Mar. 2021.

M. P. A. Starmans† and M. Koek†, *Reproducible radiomics through automated machine learning validated on twelve clinical applications*, Presented at the Euro-Bioimaging User Forum 2021: Understanding and Fighting Cancer, Jun. 2021.

M. P. A. Starmans†, *Multicentre studies for more robust radiomics signatures*, Presented at the European Congress of Radiology (ECR) 2020, Jul. 2020.

M. P. A. Starmans†, S. R. van der Voort, W. J. Niessen, and S. Klein, *A radiomics approach for colorectal liver metastases survival prediction*, Presented at the MICCAI 2017 - CPM Colorectal Liver Metastases Challenge, Sep. 2017.

M. P. A. Starmans†, *Radiomics and liver tumors*, Presented at the Current and Future Perspectives in Primary Liver Tumors Symposium 2017, Aug. 2017.

Publications

Journal Papers

E. J. Bijl*, **M. P. A. Starmans***, J. M. Mostert, S. Klein, F. J. P. M. Huygen, and C. C. de Vos, "Automatic quantification of complex regional pain syndrome using radiomics and deep learning based on thermography images," *In Preparation*.

N. Herrera, M. Camacho, E. Ruiz, R. Gatta, K. Lekadir, and **M. P. A. Starmans**, "Bias and fairness in radiomics: A comparative analysis of machine learning models on four oncology datasets," *Under Preparation*.

D. J. Höppener, W. Aswolinskiy, D. Tellez, Z. Qian, P. M. Nierop, **M. P. A. Starmans**, I. D. Nagtegaal, M. Doukas, J. H. de Wilt, D. J. Grünhagen, J. A. van der Laak, P. Vermeulen, F. Ciompi, and C. Verhoef, "Predicting survival after surgery for colorectal liver metastasis with deep learning," *Submitted*.

D. J. Spaanderman*, S. N. Hakkesteegt*, A.-R. W. Schut, C. Messiou, R. Jones, A. Hayes, L. Nardo, Y. Gaber, W. J. Niessen, G. J. L. H. van Leenders, J. J. Visser, S. Klein, D. J. Grünhagen, C. Verhoef, and **M. P. A. Starmans**, "Multi-center external validation of a radiomics model differentiating between alt and lipoma using automatic and minimally interactive segmentation methods," *Under Preparation*.

M. K. Bos, J. Kraan, **M. P. A. Starmans**, J. C. A. Helmijr, N. Verschoor, M. J. A. De Jonge, A. Joosse, A. A. M. van der Veldt, P. A. W. te Boekhorst, J. W. M. Martens, S. Sleijfer, and S. M. Wilting, "Comprehensive characterization of circulating tumor cells and cell-free DNA in patients with metastatic melanoma," *Molecular Oncology*, 2024. DOI: 10.1002/1878-0261.13650.

B.-J. Boverhof, W. K. Redekop, D. Bos, **M. P. A. Starmans**, J. Birch, A. Rockall, and J. J. Visser, "Radiology AI deployment and assessment rubric (RADAR) to bring value-based

ai into radiological practice," *Insights into Imaging*, vol. 15, p. 34, 2024. DOI: 10.1186/s13244-023-01599-z.

T. García-Lezana, M. Bobowicz, S. Frid, M. Rutherford, M. Recuero, K. Riklund, A. Cabrelles, M. Rygusik, L. Fromont, R. Francischello, E. Neri, S. Capella, F. Prior, J. Bona, P. Nicolas, M. P. A. Starmans, **K. Lekadir**, J. Rambla, and E. Consortium, "New implementation of data standards for ai research in precision oncology. experience from eucanimage," *Submitted*, 2024. medRxiv: 2024.03.15.24303032.

C. Y. M. N. Jansma, X. Wan, I. Acem, D. J. Spaanderman, J. J. Visser, D. Hanff, W. Taal, C. Verhoef, S. Klein, E. Martin, and **M. P. A. Starmans**, "Preoperative classification of peripheral nerve sheath tumors on MRI using radiomics," *Cancers*, vol. 16, no. 11, p. 2039, 2024. DOI: 10.3390/cancers16112039.

D. J. Spaanderman, **M. P. A. Starmans**, G. C. M. van Erp, D. F. Hanff, J. H. Sluijter, A.-R. W. Schut, G. J. L. H. van Leenders, C. Verhoef, D. J. Grunhagen, W. J. Niessen, J. J. Visser, and S. Klein, "Minimally interactive segmentation of soft-tissue tumors on ct and mri using deep learning," *Submitted*, 2024. arXiv: 2402.07746.

M. P. A. Starmans, R. L. Miclea, V. Vilgrain, M. Ronot, Y. Purcell, J. Verbeek, W. J. Niessen, J. N. M. Ijzermans, R. A. de Man, M. Doukas, S. Klein*, and M. G. Thomeer*, "Automated assessment of T2-weighted MRI to differentiate malignant and benign primary solid liver lesions in noncirrhotic livers usiong radiomics," *Academic Radiology*, vol. 31, no. 3, pp. 870–879, Mar. 2024. DOI: 10.1016/j.acra.2023.07.024.

H. Kondylakis, V. Kalokyri, S. Sfakianakis, K. Marias, M. Tsiknakis, A. Jimenez-Pastor, E. Camacho-Ramos, I. Blanquer, J. D. Segrelles, S. López-Huguet, C. Barelle, M. Kogut-Czarkowska, G. Tsakou, N. Siopis, Z. Sakellariou, P. Bizopoulos, V. Drossou, A. Lalas, K. Votis, P. Mallol, L. Marti-Bonmati, L. C. Alberich, K. Seymour, S. Boucher, E. Ciarrocchi, L. Fromont, J. Rambla, A. Harms, A. Gutierrez, **M. P. A. Starmans**, F. Prior, J. L. Gelpi, and K. Lekadir, "Data infrastructures for AI in medical imaging: A report on the experiences of five EU projects," *European Radiology Experimental*, vol. 7, no. 1, p. 20, May 2023. DOI: 10.1186/s41747-023-00336-x.

K. Lekadir, …, and M. P. A. Starmans, "FUTURE-AI: International consensus guideline for trustworthy and deployable artificial intelligence in healthcare," *Submitted*, 2023. arXiv: 2309.12325.

D. J. Van der Reijd, C. Guerendel, F. C. R. Staal, M. P. Busard, M. De Oliveira Taveira, E. G. Klompenhouwer, K. F. D. Kuhlmann, A. Moelker, C. Verhoef, **M. P. A. Starmans**, D. M. J. Lambregts, R. G. H. Beets-Tan, S. Benson, and M. Maas, "Independent validation of CT radiomics models in colorectal liver metastases: Predicting local tumour progression after ablation," *European Radiology*, Nov. 2023. DOI: 10.1007/s00330-023-10417-5.

M. P. A. Starmans*, M. J. M. Timbergen*, M. Vos, M. Renckens, D. J. Grünhagen, G. J. L. H. van Leenders, R. S. Dwarkasing, F. E. J. A. Willemssen, W. J. Niessen, C. Verhoef, S. Sleijfer, J. J. Visser, and S. Klein, "Differential diagnosis and molecular stratification of gastrointestinal stromal tumors on CT images using a radiomics approach," *Journal of Digital Imaging*, vol. 15, pp. 127–136, Jan. 2022. DOI: 10.1007/s10278-022-00590-2.

M. P. A. Starmans*, L. S. Ho*, F. Smits, N. Beije, I. de Kruijff, J. J. de Jong, D. M. Somford, E. R. Boevé, E. te Slaa, E. C. C. Cauberg, S. Klaver, A. G. van der Heijden, C. J. Wijburg, A. C. M. van de Luijtgaarden, H. H. E. van Melick, E. Cauffman, P. de Vries, R.

Jacobs, W. J. Niessen, J. J. Visser, S. Klein, J. L. Boormans, and A. A. M. van der Veldt, "Optimization of preoperative lymph node staging in patients with muscle-invasive bladder cancer using radiomics on computed tomography," *Journal of Personalized Medicine*, vol. 12, no. 5, Apr. 2022. DOI: 10.3390/jpm12050726.

L. Angus*, **M. P. A. Starmans***, A. Rajicic, A. E. Odink, M. Jalving, W. J. Niessen, J. J. Visser, S. Sleijfer, S. Klein, and A. A. M. van der Veldt, "The BRAF P.V600E mutation status of melanoma lung metastases cannot be discriminated on computed tomography by LIDC criteria nor radiomics using machine learning," *Journal of Personalized Medicine*, vol. 11, no. 4, p. 257, 4 Apr. 2021. DOI: 10.3390/jpm11040257.

A. Blazevic*, **M. P. A. Starmans***, T. Brabander, R. S. Dwarkasing, R. A. H. van Gils, J. Hofland, G. J. H. Franssen, R. A. Feelders, W. J. Niessen, S. Klein, and W. W. de Herder, "Predicting symptomatic mesenteric mass in small intestinal neuroendocrine tumors using radiomics," *Endocrine-Related Cancer*, vol. 28, no. 8, pp. 529–539, 8 Aug. 2021. DOI: 10.1530/erc-21-0064.

J. M. Castillo T*, M. Arif*, **M. P. A. Starmans**, W. J. Niessen, C. H. Bangma, I. Schoots, and J. F. Veenland, "Classification of clinically significant prostate cancer on multi-parametric MRI: A validation study comparing deep learning and radiomics," *Cancers*, vol. 14, no. 1, Dec. 2021. DOI: 10.3390/cancers14010012.

J. M. Castillo T, **M. P. A. Starmans**, M. Arif, W. J. Niessen, S. Klein, C. H. Bangma, I. G. Schoots, and J. F. Veenland, "A multi-center, multi-vendor study to evaluate the generalizability of a radiomics model for classifying prostate cancer: High grade vs. low grade," *Diagnostics*, vol. 11, no. 2, p. 369, 2 Feb. 2021. DOI: 10.3390/diagnostics11020369.

M. P. A. Starmans, S. R. van der Voort, T. Phil, M. J. M. Timbergen, M. Vos, G. A. Padmos, W. Kessels, D. Hanff, D. J. Grünhagen, C. Verhoef, S. Sleijfer, M. J. van den Bent, M. Smits, R. S. Dwarkasing, C. J. Els, F. Fiduzi, G. J. L. H. van Leenders, A. Blazevic, J. Hofland, T. Brabander, R. van Gils, G. J. H. Franssen, R. A. Feelders, W. W. de Herder, F. E. Buisman, F. E. J. A. Willemssen, B. Groot Koerkamp, L. Angus, A. A. M. van der Veldt, A. Rajicic, A. E. Odink, M. Deen, J. M. Castillo T, J. F. Veenland, I. Schoots, M. Renckens, M. Doukas, R. A. de Man, J. N. M. Ijzermans, R. L. Miclea, P. B. Vermeulen, E. E. Bron, M. G. Thomeer, J. J. Visser, W. J. Niessen, and S. Klein, "Reproducible radiomics through automated machine learning validated on twelve clinical applications," *Submitted*, 2021. arXiv: 2108.08618.

M. P. A. Starmans, M. J. M. Timbergen, M. Vos, G. A. Padmos, D. J. Grünhagen, C. Verhoef, S. Sleijfer, G. J. L. H. van Leenders, F. E. Buisman, F. E. J. A. Willemssen, B. G. Koerkamp, L. Angus, A. A. M. van der Veldt, A. Rajicic, A. E. Odink, M. Renckens, M. Doukas, R. A. de Man, J. N. M. IJzermans, R. L. Miclea, P. B. Vermeulen, M. G. Thomeer, J. J. Visser, W. J. Niessen, and S. Klein, "The WORC* database: MRI and CT scans, segmentations, and clinical labels for 930 patients from six radiomics studies," *Submitted*, 2021. medRxiv: 2021.08.19.21262238.

M. P. A. Starmans*, F. E. Buisman*, M. Renckens, F. E. J. A. Willemssen, S. R. van der Voort, B. Groot Koerkamp, D. J. Grünhagen, W. J. Niessen, P. B. Vermeulen, C. Verhoef, J. J. Visser, and S. Klein, "Distinguishing pure histopathological growth patterns of colorectal liver metastases on CT using deep learning and radiomics: A pilot study," *Clinical & Experimental Metastasis*, 2021. DOI: 10.1007/s10585-021-10119-6.

P. Kalendralis, Z. Shi, A. Traverso, A. Choudhury, M. Sloep, I. Zhovannik, **M. P. A. Starmans**, D. Grittner, P. Feltens, R. Monshouwer, S. Klein, R. Fijten, H. Aerts, A. Dekker, J.

Soest, and L. Wee, "FAIR-compliant clinical, radiomics and DICOM metadata of RIDER, interobserver, Lung1 and head-Neck1 TCIA collections," *Medical Physics*, vol. 47, no. 11, pp. 5931–5940, 11 Nov. 2020. DOI: 10.1002/mp.14322.

M. J. M. Timbergen*, **M. P. A. Starmans***, G. A. Padmos, D. J. Grünhagen, G. J. L. H. van Leenders, D. F. Hanff, C. Verhoef, W. J. Niessen, S. Sleijfer, S. Klein, and J. J. Visser, "Differential diagnosis and mutation stratification of desmoid-type fibromatosis on MRI using radiomics," *European Journal of Radiology*, vol. 131, p. 109 266, Oct. 2020. DOI: 10.1016/j.ejrad.2020.109266.

P. Kalendralis, A. Traverso, Z. Shi, I. Zhovannik, R. Monshouwer, **M. P. A. Starmans**, S. Klein, E. Pfaehler, R. Boellaard, A. Dekker, and L. Wee, "Multicenter CT phantoms public dataset for radiomics reproducibility tests," *Medical Physics*, vol. 46, no. 3, pp. 1512–1518, 3 Mar. 2019. DOI: 10.1002/mp.13385.

S. R. van der Voort, F. Incekara, M. M. J. Wijnenga, G. Kapas, M. Gardeniers, J. W. Schouten, **M. P. A. Starmans**, R. N. Tewarie, G. J. Lycklama, P. J. French, H. J. Dubbink, M. J. van den Bent, A. J. P. E. Vincent, W. J. Niessen, S. Klein, and M. Smits, "Predicting the 1p/19q codeletion status of presumed low-grade glioma with an externally validated machine learning algorithm," *Clinical Cancer Research*, vol. 25, no. 24, pp. 7455–7462, 24 Dec. 2019. DOI: 10.1158/1078-0432.ccr-19-1127.

M. Vos*, **M. P. A. Starmans***, M. J. M. Timbergen, S. R. van der Voort, G. A. Padmos, W. Kessels, W. J. Niessen, G. J. L. H. van Leenders, D. J. Grünhagen, S. Sleijfer, C. Verhoef, S. Klein, and J. J. Visser, "Radiomics approach to distinguish between well differentiated liposarcomas and lipomas on MRI," *British Journal of Surgery*, vol. 106, no. 13, pp. 1800–1809, Dec. 2019. DOI: 10.1002/bjs.11410.

Book Chapters

M. P. A. Starmans*, S. R. van der Voort*, J. M. Castillo T, J. F. Veenland, S. Klein, and W. J. Niessen, "Radiomics: Data mining using quantitative medical image features," in *Handbook of Medical Image Computing and Computer Assisted Intervention*, S. K. Zhou, D. Rueckert, and G. Fichtinger, Eds. Academic Press, 2020, ch. 18, pp. 429–456. DOI: 10.1016/B978-0-12-816176-0.00023-5.

Conference Papers

V. Dang†, A. Casamitjana, **M. Starmans**, C. Martín-Isla, J. Hernández-González, K. Lekadir, and Alzheimer's Disease Neuroimaging Initiative, "Auditing unfair biases in cnn-based diagnosis of alzheimer's disease," in *Clinical Image-Based Procedures, Fairness of AI in Medical Imaging, and Ethical and Philosophical Issues in Medical Imaging*, S. Wesarg, E. Puyol Antón, J. S. H. Baxter, M. Erdt, K. Drechsler, C. Oyarzun Laura, M. Freiman, Y. Chen, I. Rekik, R. Eagleson, A. Feragen, A. P. King, V. Cheplygina, M. Ganz-Benjaminsen, E. Ferrante, B. Glocker, D. Moyer, and E. Petersen, Eds., Cham: Springer Nature Switzerland, Oct. 2023, pp. 172–182. DOI: 10.1007/978-3-031-45249-9_17.

K. B. de Raad†, K. A. van Garderen, M. Smits, S. R. van der Voort, F. Incekara, E. H. G. Oei, J. Hirvasniemi, S. Klein, and **M. P. A. Starmans**, "The effect of preprocessing on convolutional neurnal networks for medical image segmentation," in *International Symposium on Biomedical Imaging (ISBI 2021)*, Apr. 2021. DOI: 10.1109/ISBI48211.2021.9433952.

J. M. Castillo T†, **M. P. A. Starmans**, W. J. Niessen, I. Schoots, S. Klein, and J. F. Veenland, "Classification of prostate cancer: High grade versus low grade using a radiomics ap-

proach," in *2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI 2019)*, Institute of Electrical and Electronics Engineers (IEEE), Apr. 2019, pp. 1319–1322. DOI: 10.1109/isbi.2019.8759217.

M. P. A. Starmans†, R. L. Miclea, S. R. van der Voort, W. J. Niessen, M. G. Thomeer, and S. Klein, "Classification of malignant and benign liver tumors using a radiomics approach," in *Medical Imaging 2018: Image Processing*, E. D. Angelini and B. A. Landman, Eds., vol. 10574, SPIE-Intl Soc Optical Eng, Mar. 2018, pp. 343–349. DOI: 10.1117/12.2293609.

Conference Abstracts

S. Derks†, L. Ho, S. Koene, **M. Starmans**, A. Joosse, M. de Jonge, J. Jongen, M. van den Bent, M. Smits, and A. van der Veldt, "Does size matter? response of melanoma brain metastases to immune checkpoint inhibitors," in *Brain Metastases Research and Emerging Therapy Conference, Paris, France*, 2023.

S. N. Hakkesteegt†, D. J. Spaanderman, A.-R. W. Schut, C. Messiou, R. Jones, A. Hayes, L. Nardo, Y. Gaber, W. J. Niessen, G. J. L. H. van Leenders, J. J. Visser, S. Klein, D. J. Grünhagen, C. Verhoef, and **M. P. A. Starmans**, "Multi-center external validation of a radiomics model differentiating between ALT and lipoma using automatic and minimally interactive segmentation methods," in *Connective Tissue Oncology Society (CTOS) Annual Meeting, Dublin, Ireland*, 2023.

D. J. Höppener, W. Aswolinskiy, D. Tellez, Z. Qian, P. M. Nierop, **M. P. A. Starmans**, I. D. Nagtegaal, M. Doukas, J. H. de Wilt, D. J. Grünhagen, J. A. van der Laak, P. Vermeulen, F. Ciompi, and C. Verhoef, "Predicting survival after surgery for colorectal liver metastasis with deep learning," in *Liver Metastases Research Network (LMRN) annual meeting 2023*, 2023.

D. J. Spaanderman†, **M. P. A. Starmans**, G. C. M. van Erp, D. F. Hanff, J. Sluiter, A.-R. W. Schut, G. J. L. H. van Leenders, C. Verhoef, W. J. Niessen, J. J. Visser, D. J. Grünhagen, and S. Klein, "Interactive segmentation of soft-tissue tumors on MRI and CT," in *Connective Tissue Oncology Society (CTOS) Annual Meeting, Dublin, Ireland*, 2023.

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S. van Gurp, K. R. Voigt, S. Klein, F. M. Vos, D. J. Grünhagen, C. Verhoef, and **M. P. Starmans**, "Predicting of histopathological growth patterns of colorectal liver metastases on ct scans: Using deep learning and radiomics," in *Liver Metastases Research Network (LMRN) annual meeting 2023*, 2023.

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A. Blazevic†, **M. P. A. Starmans**, T. Brabander, J. Hofland, G. J. H. Franssen, R. A. Feelders, W. J. Niessen, S. Klein, and W. W. de Herder, "Prediction of symptomatic mesenteric mass in patients with small intestinal neuroendocrine tumors using a CT radiomics approach," in *Neuroendocrinology*, Abstracts of the 17th Annual ENETS Conference for the Diagnosis and Treatment of Neuroendocrine Tumor Disease, vol. 110, 2020, pp. 1–312.

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