

Ruurd Kuiper, PhD

Assistant Professor (AI/NLP for Healthcare)

Utrecht, The Netherlands

Email: r.j.a.kuiper@umcutrecht.nl

ORCID: 0000-0002-6511-3896

Online:

[linkedin.com/in/ruurd-kuiper](https://www.linkedin.com/in/ruurd-kuiper)

<https://research.umcutrecht.nl/researchers/ruurd-kuiper/>

Academic positions

Assistant Professor (2024–present)

Julius Center for Health Sciences and Primary Care (Dept. Data Science & Biostatistics), UMC Utrecht, Utrecht, The Netherlands

PhD Candidate / Researcher (2017-2022)

Utrecht University / UMC Utrecht, Utrecht, The Netherlands

Dissertation: Computer-Assisted Osteotomy Planning: Medical Imaging Techniques for Orthopaedic Surgery

Research Intern (2016-2017)

UMC Utrecht, Utrecht, The Netherlands

Topic: Automatic modelling methods for bracing of the scoliotic spine

Professional experience

Senior Specialist Data Science (2023–2024)

Valcon

Applied ML/DL and NLP; agile delivery; stakeholder communication

Co-founder and Technical Lead (2022–present)

UPlanner (now Presurgeo)

Start-up co-founder; prototype development and validation; technical decision-making; productisation support

Education

PhD, Medical Image Analysis for Orthopaedics (2017-2022)

Utrecht University / UMC Utrecht

MSc, Biomedical Engineering (2015–2017)

Delft University of Technology

Research interests

- Clinical NLP and AI for healthcare: development, evaluation, implementation
 - Generative/foundation models (LLMs and multimodal models) for clinical tasks
 - Trustworthy AI: validation protocols, reliability and failure analysis
 - Medical imaging and computer-assisted planning for orthopaedics
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Grants and funding

- Applied Data Science (Utrecht University): Exploring Diffusion Models for Enhanced Medical Text Summarization (main applicant; €5k)
 - Kansen voor West: co-authored grant application (~€600k) supporting translation of PhD research into a start-up context
 - RvO start-up grant: co-authored grant application (~€40k); beneficiary via salary support at UPlanner
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Teaching experience

Instructor / course developer, Large Language Models in Healthcare - 2025

SSACAB - University of the Witwatersrand (Johannesburg, South Africa)

Short course with practicals

Teaching assistant, Advanced Machine Learning Methods in Healthcare - 2025

University of the Witwatersrand (Johannesburg, South Africa)

Co-teacher, Big Data course - 2024

Short course, UMC Utrecht

Teaching assistant, Missing Data course - 2024

MSc Epidemiology, UMC Utrecht

Teaching practicals, Medical Imaging Techniques - 2018 - 2020

MSc Image Analysis, UMC Utrecht

Supervision and mentoring

- Assisted supervision of 4 MSc thesis students during PhD
- Assisted supervision of 3 MSc thesis students as Assistant Professor

Publications (selected)

Doctoral thesis

- **Kuiper, R.** (2023). Computer-Assisted Osteotomy Planning: Medical Imaging Techniques for Orthopaedic Surgery. Utrecht University.

Full conference papers

- **Kuiper, R. J. A.**, de Groot, L., van Es, B., van Smeden, M., & Bagheri, A. (2025). LAD: LoRA-Adapted Diffusion. *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing (EMNLP): System Demonstrations*, 97–110.
- de Groot, L., **Kuiper, R. J. A.**, & Bagheri, A. (2025). A Survey of Discrete Diffusion for Text and Genomic Sequence Generation. *Proceedings of the 37th Benelux Conference on Artificial Intelligence (BNAIC) and the 34th Belgian-Dutch Conference on Machine Learning (BeNeLearn)*.

Journal articles

- **Kuiper, R. J. A.**, Seevinck, P. R., Viergever, M. A., Weinans, H., & Sakkers, R. J. B. (2023). Automatic Assessment of Lower-Limb Alignment from Computed Tomography. *The Journal of Bone and Joint Surgery. American Volume*, 105(9), 700–712.
- **Kuiper, R. J. A.**, Colaris, J. W., Stockmans, F., van Es, E. M., Viergever, M. A., Seevinck, P. R., Weinans, H., & Sakkers, R. J. B. (2023). Impact of bone and cartilage segmentation from CT and MRI on both bone forearm osteotomy planning. *International Journal of Computer Assisted Radiology and Surgery*, 18(12), 2307–2318.
- **Kuiper, R. J. A.**, Sakkers, R. J. B., van Stralen, M., Arbabi, V., Viergever, M. A., Weinans, H., & Seevinck, P. R. (2022). Efficient cascaded V-net optimization for lower extremity CT segmentation validated using bone morphology assessment. *Journal of Orthopaedic Research*, 40(12), 2894–2907.
- **Kuiper, R. J. A.**, van Stralen, M., Sakkers, R. J. B., Bergmans, R. H. J., Zijlstra, F., Viergever, M. A., Weinans, H., & Seevinck, P. R. (2021). CT to MR registration of complex deformations in the knee joint through dual quaternion interpolation of rigid transforms. *Physics in Medicine and Biology*, 66.
- **Kuiper, R. J. A.** (2017). A Finite Element Approach to Brace Treatment for the Scoliotic Spine. *Unpublished internship research*, UMC Utrecht.

Co-authored publications

- Veerman, Q. W. T., Tuijthof, G. J. M., Verdonschot, N., ... **Kuiper, R. J. A.**, ... (2025). A structured framework for standardized 3D leg alignment analysis: an international Delphi consensus study. *Knee Surgery, Sports Traumatology, Arthroscopy*, 33(6), 2276–2292.

- Bax, E. A., Kerkhof, J. A. J., van Egmond, N., **Kuiper, R. J. A.**, ... (2025). The Impact of varus and valgus alignment on knee cartilage quality assessed by magnetic resonance imaging. *The Knee*, 57, 477–487.
- Nguyen, C., Bax, E., Custers, R., van Egmond, N., **Kuiper, R.**, Arbabi, V., ... (2025). Progression of bone and intra-articular joint space deformity in patients with mild knee osteoarthritis: data from the IMI-APPROACH cohort. *Osteoarthritis and Cartilage*, 33, S363.
- Bax, E., Custers, R. J., van Egmond, N., Rayegan, H., **Kuiper, R.**, ... (2025). Bony Varus Malalignment Accelerates Knee Osteoarthritis Progression: Insights from Joint Line Convergence Angle in the IMI-APPROACH Cohort. *Osteoarthritis and Cartilage*, 33, S190.
- Willemsen, K., Ketel, M. H. M., Zijlstra, F., Florkow, M. C., **Kuiper, R. J. A.**, ... (2021). 3D-printed saw guides for lower arm osteotomy, a comparison between a synthetic CT and CT-based workflow. *3D Printing in Medicine*, 7, 1–12.
- Anadria, D., Dobbe, R., Giachanou, A., **Kuiper, R.**, Bartels, R., van Amsterdam, W., de Troya, I. M., Zürcher, C., & Oberski, D. (2025). From Data-Driven to Purpose-Driven Artificial Intelligence: Systems Thinking for Data-Analytic Automation of Patient Care. *arXiv preprint arXiv:2506.13584*.

Academic service

Peer reviewer (selected journals)

- BioMed Research International
- Artificial Intelligence in Medicine
- International Journal of Computer Assisted Radiology and Surgery (IJCARS)
- BMC Musculoskeletal Disorders
- Journal of Orthopaedic Surgery and Research
- Scientific Reports (Nature Portfolio)
- Biomedical Engineering / Biomedizinische Technik

Certifications

eBROK® Basiscursus + Verdieping nWMO, NFU – Nederlandse Federatie van Universitair Medische Centra (Issued Jan 2026; expires Jan 2028)

Natural Language Processing Specialization, Coursera (Issued Sep 2023)

SQL Essential Training, LinkedIn Learning (Issued May 2023)

Skills

Programming: Python, MATLAB, R, Swift, C#

ML/DL: PyTorch, TensorFlow; computer vision; NLP; evaluation and validation pipelines

Data/engineering: NumPy/SciPy, scikit-learn, pandas; software development and prototyping; agile/Scrum

Last updated: 9 January 2026