



# Clemens Spielvogel

## Postdoctoral Research Scientist

Medial data scientist with a strong life science background and a specialization in the application and validation of predictive modeling solutions in cancer research, oncology, and cardiac amyloidosis. Know-how in the application of explainable artificial intelligence, vision-based deep learning, and analysis of high-dimensional biomedical data. Experienced in solving complex problems together with clinical, biological and computer science experts.

## Experience

### 2023 - now

Medical University of Vienna

#### Postdoctoral Research Scientist

- Leading an international clinical trial concerned with the development and validation of an artificial intelligence system for image-based cardiac amyloidosis screening
- Development and validation of a novel approach for the extraction of disease-specific cardiometabolic risk markers

### 2019 - 2023

Medical University of Vienna

#### Doctoral Researcher

- Development of an unsupervised approach for deep learning-based characterization of scintigraphy images
- Development of an automated and explainable machine learning framework
- Investigation of hand-engineered image features for the non-invasive prediction of genetic characteristics in head and neck cancer patients

### 2018

Medical University of Vienna

#### Machine Learning Engineer | Research Assistant

- Implementation of a system for feature extraction from medical imaging data

### 2019-2022

University of Applied Sciences Technikum Vienna

#### Lecturer

- Thesis supervisions and lecturing 'Machine Learning', 'Computer Vision' and practical course 'Introduction to Artificial Intelligence for Bachelor program Computer Science

## Awards and Certifications

- Stanford University Medical Statistics Professional Program (2022-2023)
- IBM-certified Data Science Professional (2021-2022)
- Carl Apstein Award - Best oral presentation (2024)
- Medical Imaging Cluster Festival Award - Best oral presentation (2023)

## Volunteering

- Session co-chair at the European Nuclear Medicine Association (EANM) conference 2023
- Co-authoring of the European Nuclear Medicine Guide 2020 (EANM)
- Student representative 2013-2016 (Veterinary Medical University of Vienna)

## Contact

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Medical University of Vienna  
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## Education

Feb 2019 - Sep 2023

### Doctor of Philosophy (Ph.D.)

Medical University of Vienna

Computational Medical Imaging

Oct 2016 - Jun 2018

### Master of Science (M.Sc.)

University of Applied Sciences Campus Vienna

Bioinformatics

Oct 2013 - Jun 2016

### Bachelor of Science (B.Sc.)

University of Veterinary Medicine Vienna

Biomedicine and Biotechnology

## Expertise

- Machine Learning
- Vision-based Deep Learning
- Explainable Artificial Intelligence
- Cardiovascular Imaging
- Quantitative Imaging Markers
- Imaging / Non-Imaging Data Integration

## Language

German (Native language)

English (Professional language)

## Peer-reviewed Oral Conference Presentations

- **Cardiovascular Research Days:** “Artificial intelligence-enabled cardiac amyloidosis screening on bone scintigraphy” 2024
- **Cardiovascular Cluster (CVC) Annual Meeting:** “Screening for abnormal cardiac scintigraphy uptake at risk for cardiac amyloidosis using deep learning” 2023
- **European Nuclear Medicine Association (EANM):** “Detection of cardiac amyloidosis using artificial intelligence on bone scintigraphy: An international, multi-center, multi-tracer study” 2023
- **Medical Imaging Cluster (MIC) Festival:** “Development and Validation of an Artificial Intelligence System for Expert-Level Cardiac Amyloidosis Detection using Bone Scintigraphy” 2023
- **European Nuclear Medicine Association (EANM):** “Evaluation of quantum-encoding for machine learning features in neural network-based predictive models” 2020

## Invited Presentations

- **Austrian Society of Medical Physicists:** “Artificial intelligence in Nuclear Medicine” (2023) 2023
- **Biomedical Summer School:** “Cardiac Amyloidosis Screening using Artificial Intelligence in Medical Imaging” 2023
- **Postgraduate COMULIS Training School for Radiomics and AI in Molecular Imaging:** “Machine Learning Platforms and Model Validation” 2021
- **North German Society of Nuclear Medicine:** “The role of Radiomics in Nuclear Medicine” 2019

## List of Publications

- Diagnosis and prognosis of abnormal cardiac scintigraphy uptake at risk for cardiac amyloidosis using artificial intelligence: An international, multi-center, cross-tracer development and validation study; **C P Spielvogel**, D Haberl, [...], Marcus Hacker and Christian Nitsche; [The Lancet Digital Health](#) 2024
- Radiogenomic markers enable risk stratification and inference of mutational pathway states in head and neck cancer; **C P Spielvogel**, S Stoiber, L Papp, [...], L Kenner and A R Haug; [European Journal of Nuclear Medicine and Molecular Imaging](#) 2022
- Mitochondrial polymorphism m3017C>T of SHLP6 relates to heterothermy; S V Emser, **C P Spielvogel**, E Millesi, R Steinborn; [Frontiers in Physiology](#) 2023
- Error mitigation enables PET radiomic cancer characterization on quantum computers; S Moradi, **C P Spielvogel**, D Krajnc, [...], L Papp; [European Journal of Nuclear Medicine and Molecular Imaging](#) 2023
- DEBI-NN: Distance-encoding biomorphic-informational neural networks for minimizing the number of trainable parameters; L Papp, D Haberl, B Ecsedi, **C P Spielvogel**, [...], Wolfgang Drexler; [Neural Networks](#) 2023
- Machine learning predictive performance evaluation of conventional and fuzzy radiomics in clinical cancer imaging cohorts; M Grahovac, **C P Spielvogel**, [...], A Haug & Laszlo Papp; [European Journal of Nuclear Medicine and Molecular Imaging](#) 2023
- Sex-specific radiomic features of L-[S-methyl-11C] methionine PET in patients with newly-diagnosed gliomas in relation to IDH1 predictability; L Papp, S Rasul, **C P Spielvogel**, D Krajnc, N Poetsch, A Woehrer, E Patronas, B Ecsedi, J Furtner, M Mitterhauser, I Rausch, G Widhalm, T Beyer, M Hacker and T Traub-Weidinger; [Frontiers in Oncology](#) 2023
- Automated data preparation for in vivo tumor characterization with machine learning; D Krajnc, **C P Spielvogel**, M Grahovac, [...], T Beyer, L Papp; [Frontiers in Oncology](#) 2022
- Multi-lesion radiomics of PET/CT for non-invasive survival stratification and histologic tumor risk profiling in patients with lung adenocarcinoma; M Zhao, K Kluge, L Papp, M Grahovac, S Yang, CJiang, D Krajnc, **C P Spielvogel**, [...], W Zhang, X Li; [European Radiology](#) 2022
- Clinical data classification with noisy intermediate scale quantum computers; S Moradi, C Brandner, **C P Spielvogel**, D Krajnc, S Hillmich, R Wille, W Drexler and L Papp; [Scientific Reports](#) 2022
- Bleeding risk assessment in end-stage kidney disease: validation of existing risk scores and evaluation of a machine learning-based approach; S Nopp, **C P Spielvogel**, S Schmaldienst, [...], O Königsbrügge, C Ay; [Thrombosis and Haemostasis](#) 2022
- Toward Quantitative in vivo Label-Free Tracking of Lipid Distribution in a Zebrafish Cancer Model; M Andreana, C Sturtzel, **C P Spielvogel**, [...], M Distel and A Unterhuber; [Frontiers in Cell and Developmental Biology](#) 2021
- Morpho-Molecular Metabolic Analysis and Classification of Human Pituitary Gland and Adenoma Biopsies Based on Multimodal Optical Imaging; G Giardina, A Micko, D Bovenkamp, A Krause, F Placzek, L Papp, D Krajnc, **C P Spielvogel**, [...], S Wolfsberger and A Unterhuber; [Cancers](#) 2021
- Supervised machine learning enables non-invasive lesion characterization in primary prostate cancer with [Ga]Ga-PSMA-11 PET/MRI; L Papp, **C P Spielvogel**, B Grubmüller, [...], M Hartenbach and M Hacker; [European Journal of Nuclear Medicine and Molecular Imaging](#) 2021
- Breast Tumor Characterization Using [18F]FDG-PET/CT Imaging Combined with Data Preprocessing and Radiomics; D Krajnc, L Papp, T S Nakuz, H F Magometschnigg, M Grahovac, **C P Spielvogel**, [...], T H Helbich and K Pinker; [Cancers](#) 2021
- Transcription factors CP2 and YY1 as prognostic markers in head and neck squamous cell carcinoma: analysis of The Cancer Genome Atlas and a second independent cohort; J Schnoell, B J Jank, L Kadletz-Wanke, S Stoiber, **C P Spielvogel**, E Gurnhofer, L Kenner & G Heiduschka; [Journal of Cancer Research and Clinical Oncology](#) 2021
- Personalizing Medicine Through Hybrid Imaging and Medical Big Data Analysis; L Papp, **C P Spielvogel**, I Rausch, M Hacker and T Beyer; [Frontiers in Physics](#) 2018