

# SERENA BONARETTI

## Curriculum Vitae

### PERSONAL INFORMATION

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### PERSONAL STATEMENT

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My research focuses on developing open and reproducible computational tools for standardizing, processing, and analyzing musculoskeletal (MSK) imaging data. The long-term goal is to advance the understanding, diagnosis, and treatment of age-related MSK diseases in a collaborative, reliable, and efficient approach. I am a co-founder and the coordinator of the [ORMIR Community](#), and I authored the textbook [Learn Python with Jupyter: Develop Computational Thinking While Learning Coding](#).

### EMPLOYMENT

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01.2025 – present	Independent Senior Research Scientist and Teacher, Zürich, Switzerland
10.2022 – 12.2024	Senior Research Scientist, Balgrist Campus, Zürich, Switzerland
08.2020 – 09.2022	Independent Teacher, C as in Coding (sole proprietorship), Maastricht, The Netherlands
10.2019 – 09.2022	Independent Research Scientist, Transparent MSK Research (sole proprietorship), Maastricht, The Netherlands
03.2019 – 08.2019	Research Scientist, Department of Bioinformatics, Maastricht University, The Netherlands Projects: <i>NanoSolveIT</i> and <i>RiskGONE</i> (Engineered nanomaterial toxicology) Advisor: Egon Willighagen
01.2016 – 07.2018	Physical Science Research Specialist, Department of Radiology, Stanford University, USA Research Biomedical Engineer, Department of Veterans Affairs, Palo Alto, USA Projects: <i>Automatic segmentation of MR images of the knee</i> and <i>Weight-bearing imaging of the knee using C-arm CT</i> Advisors: Gary Beaupre and Garry Gold
01.2015 – 12.2015	Associate Specialist, Department of Radiology and Biomedical Imaging, University of California, San Francisco, USA Project: <i>Standardization of acquisition procedure for bone imaging for multicenter clinical research</i> Advisors: Thomas Lang and Andrew Burghardt
03.2012 – 12.2014	Postdoctoral Scholar, Department of Radiology and Biomedical Imaging, University of California, San Francisco, USA Project: <i>Standardization of acquisition procedure for bone imaging for multicenter clinical research</i> Advisors: Thomas Lang and Andrew Burghardt
11.2005 – 11.2007	Clinical Engineer, Department of Audiology, Fondazione Audiologica Varese ONLUS, Ospedale di Circolo - Fondazione Macchi, Varese, Italy Role: Responsible of the department instrumentation and support for scientific activities Advisor: Sandro Burdo

- 04.2005 – 10.2005      Research Assistant, Institute of Biomedical Engineering - National Research Council of Italy (ISIB-CNR), Politecnico di Milano, Italy  
                                  Project: *Segmentation of mandibular nerve from CT images*  
                                  Advisors: Gabriella Tognola and Paolo Ravazzani
- 05.2003 – 07.2003      Research Assistant, Institute of Biomedical Engineering - National Research Council of Italy (ISIB-CNR), Politecnico di Milano, Italy  
                                  Project: *Segmentation of brain image for electromagnetic field estimation*  
                                  Advisors: Paolo Ravazzani and Marta Parazzini

## EDUCATION

- 12.2007 – 01.2012      PhD in Biomedical Engineering, Institute for Surgical Technology and Biomechanics, University of Bern, Switzerland  
                                  Thesis: *Statistical Models of Shape and Density for Population-based Analysis of Bone Mechanics with Applications to Fracture Risk Assessment and Implant Design*  
                                  Advisors: Mauricio Reyes and Philippe Büchler
- 10.2003 – 10.2005      MSc in Biomedical Engineering, Politecnico di Milano, Italy  
                                  Thesis: *Methods for 2D and 3D segmentation and rendering of CT images: Validation and application in maxillofacial surgery* (in Italian)  
                                  Advisors: Gabriella Tognola and Paolo Ravazzani
- 10.2000 – 10.2003      BSc in Biomedical Engineering, Politecnico di Milano, Italy  
                                  Advisor: Paolo Ravazzani

## OPEN SOURCE SOFTWARE

### Developed

1. *pyKNEEr* ([GitHub repository](#), [documentation](#), [video](#))  
 An image analysis workflow for open and reproducible research on femoral knee cartilage
2. *SAMforFEM* ([GitHub repository](#), [documentation](#))  
 Statistical appearance model (SAM) of femur for finite element (FE) simulations of different populations

### Contributing

1. *ORMIR-MIDS* ([GitHub repository](#), [documentation](#))  
 A Python package and standard for the management of MSK medical images
2. *ORMIR\_XCT* ([GitHub repository](#))  
 A Python package for the processing of High Resolution peripheral Quantitative Computed Tomography (HR-pQCT) images

### Supervised

1. *Reference line - Training & evaluation* ([Web application](#), [GitHub repository](#), [documentation](#))  
 A web application to train and evaluate operators when scanning with High Resolution Peripheral Quantitative Computed Tomography (HR-pQCT).  
 Student: Caroline Mai Chan, University of California, San Francisco, USA.
2. *FEM assigner* ([GitHub repository](#), [documentation](#))  
 Assigning bone material properties to finite element (FE) meshes from quantitative computed tomography images  
 Student: Andreas Siegrist, University of Bern, Switzerland.

## FUNDING AND AWARDS

### FUNDED PROPOSALS

11.2024	<i>Advancing Musculoskeletal Research through Dissemination of an Open-Source Bone Microarchitecture Analysis Toolkit</i> Role: Co-Applicant. Funder: Canadian Institutes of Health Research (Canada). Amount: 20K CAD
03.2024	<i>Standardizing computational workflows to create personalized image-based knee models</i> Role: Single applicant. Funder: Balgrist Foundation (Switzerland). Amount: 30K CHF (Funding redirected after approval)
08.2023	<a href="#"><u>Sharing and curating open data in musculoskeletal imaging research</u></a> Role: Main applicant. Funder: Swiss National Science Foundation (Switzerland). Amount: 20K CHF
07.2022	<i>Development of an open-source reference data set, image repository, and interactive training tool for bone damage assessment in inflammatory arthritis</i> Role: Co-Applicant. Funder: Canadian Institutes of Health Research (Canada). Amount: 10K CAD
01.2020	<a href="#"><u>Building the Jupyter Community in Musculoskeletal Imaging Research</u></a> Role: Main applicant. Funder: NumFOCUS (USA). Amount: 19K USD
01.2020	<i>Exploration of SPECTRA image metadata for database development</i> Role: Co-Applicant. Funder: Canadian Institutes of Health Research (Canada).

### NON-FUNDED PROPOSALS (as main or single applicant)

03.2024	<i>Quantifying in-vivo bone changes using photon counting detector computed tomography imaging</i> Role: Single applicant. Funder: Swiss National Science Foundation (Switzerland). Requested amount: 100K CHF
06.2023	<i>Creation of the Swiss Center for Musculoskeletal Computing at Balgrist Campus</i> Role: Main applicant. Funder: State Secretariat for Education, Research, and Innovation (Switzerland). Requested amount: 9.5M CHF
09.2022	<a href="#"><u>Unifying and disseminating musculoskeletal imaging software</u></a> Role: Main applicant. Funder: Chan Zuckerberg Initiative (USA). Requested amount: 350K CHF
04.2022	<i>pyMSK: Making MSK imaging workflows open and reproducible.</i> Role: Main applicant. Funder: Chan Zuckerberg Initiative (USA). Requested amount: 346K CHF
01.2017	<i>Quantitative analysis of morphology and biomechanics in femoroacetabular impingement</i> Role: Single applicant. Grant type: PRIMA (career grant). Funder: Swiss National Science Foundation (Switzerland). Requested amount: 750K CHF
04.2014	<i>Osteoporosis due to celiac disease</i> Role: Main applicant. Funder: University of California, San Francisco, Department of Radiology (USA). Requested amount: 10K USD

### AWARDS AND HONORARIA

08.2024	Faculty of Engineering and Information Technology Visiting Fellowship. Funder: University of Melbourne (Australia). Amount: 3850 AUD
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07.2023	Invited speaker support to participate at the 16 <sup>th</sup> Congress of the International Society for Bone Morphometry (ISBM), Toronto, Canada in 2024. Funder: International Society for Bone Morphometry (USA). Amount: conference registration and 1950 USD
03.2023	Participation to JupyterCon 2023. Funder: NumFOCUS (USA). Amount: 600 USD
07.2022	Honorarium for organizing the workshop “Building the Jupyter Community in Musculoskeletal Imaging Research” on June 9-11, 2022. Funder: NumFOCUS (USA). Amount: 500 USD
10.2014	Young Investigator Award, poster presentation, second author. Funder: American Society for Bone Mineral Research (USA). Amount: without remuneration

## TEACHING AND MENTORING

### TEACHING WORKSHOPS

07.06. 2024	<a href="#">Open Science in Practice</a> Workshop at the Summer School of the Swiss Bone and Mineral Society. Olten, Switzerland.
16.11.2023	<a href="#">Hands on bookclub workshop: “Learn Python with Jupyter”</a> PyLadies Hamburg. Hamburg, Germany
10.06.2022	<a href="#">Open and reproducible second layer analysis using Jupyter Notebook and Python</a> Jupyter Community Workshop: Building the Jupyter Community in MSK Imaging. Maastricht, The Netherlands
09.06.2022	<a href="#">Introduction to the Jupyter ecosystem and Python</a> Jupyter Community Workshop: Building the Jupyter Community in MSK Imaging. Maastricht, The Netherlands
22.01.2020	<a href="#">Python and Jupyter Notebook for Medical Image Analysis</a> OpenMR Benelux, Nijmegen, The Netherlands

### ONE-TO-ONE TEACHING

08.2020 – 09.2022	Teaching coding and computational thinking. Support for university exams and projects. Student reviews <a href="#">here</a> .
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### IN-CLASS TEACHING

11.2017	Guest Lecturer, Surgery Without All the Blood (RAD 70N), Stanford University, USA <i>Introduction to Interventional Radiology at the Zeego Lab</i> (Laboratory)
04.2017 – 06.2017	Co-instructor (50%), Orthopaedic Bioengineering (BIOE/ME 381), Stanford University, USA <a href="#">Bone anatomy and physiology</a> , <a href="#">Bone mechanics at the organ and tissue level</a> , <a href="#">Principles of X-ray imaging and bone imaging</a> , and <a href="#">Bone quality, fracture, and fixation</a> (Lectures). Bone fixation (Laboratory)
01.2017, 01.2018	Guest Lecturer, Clinical Needs and Technology (BIOE 301B), Stanford University, USA <a href="#">Introduction to X-ray-based Imaging</a> (Lecture) <i>Minimally Invasive Therapies in Swine</i> (Laboratory)
10.2016	Guest Lecturer, Introduction to Bioengineering Research (BIOE 390/MED 289), Stanford University, USA <i>Weight-bearing Imaging of the Knee Using C-arm CT</i> (Lecture)

03.2015	Guest Lecturer, Image Processing and Analysis II (BI 265), University of California San Francisco, USA <i>Active Shape and Appearance Modeling in Medical Imaging</i> (Blackboard lecture)
01.2014, 01.2015	Guest Lecturer, Musculoskeletal Imaging (BI 240), University of California San Francisco, USA <i>Assessment of Bone Strength - Foundations of FE and microFE</i> (Blackboard lecture)
12.2009	Guest Lecturer, Medical Image Analysis, ETH Zürich, Switzerland <a href="#">Statistical Shape Models</a> (Lecture)
10.2009	Guest Lecturer, Medical Image Analysis, University of Bern, Switzerland <a href="#">Statistical Shape Models</a> (Lecture)

## MENTORING

07.2024 – 03.2025	Yurong Chen, M.Sc. thesis. <i>Interactive visualization for quality control and exploration of multimodal knee osteoarthritis data</i> . University of Zurich, Switzerland. Co-supervisor: Jürgen Bernard
06.2024 – 08.2024	Hemachandra Konduru, summer project. University of Wisconsin, USA
11.2023 – 11.2024	Abhishek Samanta, internship and M.Sc. thesis. <i>Guided few-shot segmentation of magnetic resonance images of the knee</i> . Saarland University, Germany. Co-supervisors: Bernd Schiele, Anjany Sekuboyina
09.2023 – 03.2023	Yannick Wattenberg, internship. <i>Validation of photon counting detector computed tomography femur images using deep learning</i> . ETH Zurich, Switzerland. Co-supervisors: Vincent Stadelmann, Bastian Wittmann
07.2023 – 02.2024	Francesco Chiumento. M.Sc. thesis. <i>Development, testing and evaluation of automatic methods for knee cartilage segmentation from magnetic resonance images: application to a cohort of patients affected by medial knee osteoarthritis</i> . Rizzoli Orthopaedic Institute Bologna and University of Padova, Italy. Co-supervisor: Fulvia Taddei
02.2022 – 07.2022	Ranjan Mishra, B.Sc. thesis. <i>Conformal prediction for OAI biomarkers</i> . University College Maastricht, The Netherlands. Co-supervisor: Christof Seiler
03.2017 – 02.2018	Fatih Chengiz, M.Sc. thesis. <i>Automatic segmentation of the meniscus from MR images</i> . University of Erlangen-Nuremberg, Germany. Co-supervisor: Andreas Meier
06.2016 – 08.2016	Alyssa Hobson and Sandra Ortellado, Summer project. <i>Segmentation of knee bones from weight-bearing cone-beam computed tomography images</i> . Stanford University, USA. Co-supervisors: Members of the Garry Gold's and Marc Levenston's labs
06.2016 – 08.2016	Francisco Lopez and Heidi Poppe, Summer project. <i>Subject's support platform for weight-bearing cone-beam computed tomography imaging</i> . Stanford University, USA. Co-supervisors: Members of the Garry Gold's and Marc Levenston's labs
05.2015 – 12.2015	Caroline Mai Chan. Development of webapp: <a href="#">Reference line – Training and Evaluation</a> . University of California San Francisco, USA. Co-supervisor: Andrew Burghardt
06.2014 – 12.2015	Andrew Yu, Internship. <i>Data management for the MrOS project</i> . University of California San Francisco, USA. Co-supervisor: Andrew Burghardt
09.2010 – 03.2011	Saloni Soin, M.Sc. thesis. <i>Preformed cranial implants</i> , University of Bern, Switzerland. Co-supervisor: Mauricio Reyes
11.2009 – 10.2010	Andreas Siegrist, B.Sc. thesis on Bone material property assignment for finite element analysis, Fachhochschule Nordwestschweiz Biel and University of Bern, Switzerland. Co-supervisor: Mauricio Reyes and Benedikt Helgason

## TALKS AND EVENTS

### INVITED TALKS

13.02.2025	<a href="#">ORMIR-MIDS: An Open Standard for Curating and Sharing Musculoskeletal Imaging Data (video)</a> International Love Data Week. University of Basel, Switzerland (virtual)
01.11.2024	<a href="#">Why and how to do open and reproducible MSK imaging research</a> BME & GCI Mini-Symposium “Reproducible and Reliable Data Science for Health Applications”. University of Melbourne, Australia
03.10.2024	<a href="#">Why and how to do open and reproducible MSK imaging research</a> 16 <sup>th</sup> Congress of the International Society for Bone Morphometry (ISBM). Toronto, Canada
08.12.2023	<a href="#">Introducing the ORMIR community</a> MRI Together – A Global Workshop on Open Science and Reproducible Research. Virtual
17.11.2023	<a href="#">Introducing the ORMIR community and the book “Learn Python with Jupyter” (video at 1h47’)</a> Python Pizza Hamburg. Hamburg, Germany
09.06.2023	<a href="#">Why and how to do open and reproducible research</a> Summer school of the Swiss Bone and Mineral Society. Thun, Switzerland
11.05.2023	<a href="#">Introducing the ORMIR community and the book “Learn Python with Jupyter” (video at 58’)</a> Lightening talk. JupyterCon 2023.
09.02.2023	<a href="#">Why and how to do open and reproducible research (video)</a> European Society of Biomechanics. Webinar.
10.11.2022	<a href="#">Open and reproducible coding: Perspective of an MSK imaging researcher (video)</a> Open Science Seminar Series, University of Basel, Switzerland. Webinar.
10.05.2022	<a href="#">Open Science: Perspective of a researcher who codes</a> The Reproducibility Crisis – Perspectives from Funders, Researchers, and Journal Editors, Workshop at the International Society for Magnetic Resonance in Medicine (ISMRM) Conference. London, United Kingdom.
14.03.2022	<a href="#">Within the data life cycle: Perspective of an MSK imaging researcher</a> Informatics Institute, University of Amsterdam. Amsterdam, The Netherlands
13.12.2021	<a href="#">Debate: Open Science in the MR Community (video)</a> MRI Together – A Global Workshop on Open Science and Reproducible Research. Virtual
12.11.2021	<a href="#">Development of a centralized metadata and data syndication platform for SPECTRA</a> SPECTRA 2021 Virtual Workshop. Virtual.
02.07.2021	<a href="#">Open data: Perspective of an MSK researcher who codes (video)</a> Panel discussion “The Open Data Paradigm”, The International Workshop on Osteoarthritis Imaging. Rotterdam, The Netherlands.
11.07.2020	<a href="#">Why we should use Jupyter notebook in Medical Image Analysis (video)</a> Think Open Rovereto Workshop. Trento University, Italy (virtual)
26.09.2019	<a href="#">Transparent Quantitative Musculoskeletal Imaging</a> Department of Mechanical Engineering, Division of Biomechanics, KU Leuven. Leuven, Belgium.
12.09.2019	<a href="#">Transparent Research: Open-Access Data, Reproducible Workflows, and Interactive Publications</a> 7 <sup>th</sup> Annual Tomography for Scientific Advancement (ToScA) Symposium. Southampton, United Kingdom.
20.06.2019	<a href="#">Transparent Quantitative Musculoskeletal Imaging</a> Department of Radiology, Erasmus Medical Center. Rotterdam, The Netherlands.
02.05.2019	<a href="#">Data Management for Transparent Research</a> BiGCaT Science Café, Maastricht University. Maastricht, The Netherlands.
18.04.2019	<a href="#">Transparent Research: Open-Access Data, Reproducible Workflows, and Interactive Publications</a> BiGCaT Science Café. Maastricht University. Maastricht, The Netherlands.

- 22.12.2015 [Bone quality by QCT and HR-pQCT: Translation to multicenter clinical research](#)  
Istituti Ortopedici Rizzoli. Bologna, Italy
- 16.12.2015 [Bone quality by QCT and HR-pQCT: Translation to multicenter clinical research](#)  
Pattern Recognition Lab, University of Erlangen-Nuremberg. Erlangen, Germany
- 16.09.2014 *Intra- and inter-operator variability in HR-pQCT scan positioning*  
2nd XtremeCT User Meeting, workshop at the American Society for Bone and Mineral Research (ASBMR) conference. Houston, TX, USA

## CHAIRING AND ORGANIZING WORKSHOPS AND CONFERENCES

- 5.11.2024 *Why and how to share musculoskeletal imaging data?* Workshop at the 24<sup>th</sup> International Workshop on Quantitative Musculoskeletal Imaging (QMSKI). Barossa Valley, Australia  
Role: Co-organizer and presenter
- 15-18.01.2024 [Sharing and curating open data in musculoskeletal imaging research](#). Zurich, Switzerland  
Role: Chair, co-organizer
- 13.06.2022 [Introducing the Open and Reproducible Musculoskeletal Imaging Research \(ORMIR\) community](#). Workshop at the 23<sup>rd</sup> International Workshop on Quantitative Musculoskeletal Imaging (QMSKI). Noordwijk, The Netherlands  
Role: Chair, co-organizer, and presenter
- 9-11.06.2022 [Jupyter Community Workshop: Building the Jupyter Community in MSK Imaging](#). Maastricht, The Netherlands  
Role: Chair, organizer, and lecturer
- 25.02.2019 [Hands-on transparent QMSKI: Open-access data, reproducible workflows, and interactive publications](#). Workshop at the 22<sup>nd</sup> International Workshop on Quantitative Musculoskeletal Imaging (QMSKI), Chateau Lake Louise, AB, Canada  
Role: Chair, organizer, and presenter
- 6-9.07.2008 *16th Congress of the European Society of Biomechanics*. Lucerne, Switzerland  
Role: Staff member
- 9-12.05.2007 *Objective Measures in Cochlear and Brainstem Implants – 5<sup>th</sup> International Symposium and Related Additional Events*. Varese, Italy  
Role: Organizing committee and staff member

## DISSEMINATION

### EVENTS

- 01.06.2025 Presentation of the book [Learn Python with Jupyter – Learn Computational Thinking While Learning Coding](#) at the 11<sup>th</sup> Bay Area Book Festival. Berkeley, USA

### INTERVIEWS

- 19.08.2023 [La Cultura del Dato](#), by Stefano Gatti (in Italian with English translation)

### VIDEOS

- 12.2019 – present [YouTube channel](#) with basics and hands-on tutorials on Open and Reproducible Research. Playlists with videos I created: [Step-by-step Tutorials for Transparent Research](#), [Transparent Research 101](#), [Jupyter Notebook and Python for Scientists](#), and [Medical Image Analysis](#)  
Playlist with videos I collect: [Serena's talks](#), [Coding Women](#)



## SERVICE

### COMMUNITY AND UNIVERSITY SERVICE

12.2019 – present	Co-founder and coordinator of the Open and Reproducible MSK Imaging Research (ORMIR) community ( <a href="http://ormir.org">ormir.org</a> )
09.2023 – 09.2024	Member of the Insight Software Consortium Council (ITK) ( <a href="http://insightsoftwareconsortium.org">insightsoftwareconsortium.org</a> )
11.2016 – 07.2018	Associate Director of the Zeego Laboratory, Department of Radiology, Stanford University, USA
01.2016 – 07.2018	Creation and maintenance of webpages of the JOINT group and of the Zeego Lab, Stanford University, USA
01.2015 – 12.2015	Contribution to the webpage of the Musculoskeletal CT Imaging Research Group, University of California San Francisco, USA
01.2010 – 12.2011	Contribution to the webpage of the Institute for Surgical Technology and Biomechanics, University of Bern, Switzerland

### SCIENTIFIC REVIEWING ACTIVITIES

#### Conference reviewer

2024 – present	Member of the Scientific Review Committee and of the Open Science Award Committee for the 24 <sup>th</sup> QMSKI workshop
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#### Grant reviewer

2015 – 2016	American Society for Bone and Mineral Research
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#### Journal reviewer

2016 – present	Physica Medica
2016 – present	Biomechanics and Modeling in Mechanobiology
2015 – present	Journal of Computer Methods in Biomechanics and Biomedical Engineering
2014 – present	Journal of Bone and Mineral Research
2014 – present	Journal of Medical Imaging and Health Informatics
2014 – present	Bone
2013 – present	Journal of Biomechanics
2013 – present	Medical Physics
2011 – present	IEEE - Transaction on Medical Imaging

### MEMBERSHIPS IN SCIENTIFIC SOCIETIES

2016 - 2017	International Society for Magnetic Resonance in Medicine
2016 - 2017	Osteoarthritis Research Society International
2012 - 2015	American Society of Bone and Mineral Research
2008 - 2010	European Society of Biomechanics

## PUBLISHING

### TEXTBOOK

1. Bonaretti S. [Learn Python with Jupyter – Develop Computational Thinking While Learning Coding](#). 2025.



## NON-ACADEMIC WRITING

1. Bonaretti S. [Introducing “Learn Python with Jupyter” – A free course book to develop computational thinking while learning to code](#). 28 April 2023. Blogpost on Jupyter Blog in Medium.com.
2. Bonaretti S., Cameron D., Kuczynski M., Iori G., on behalf of the participants to the workshop. [Report on the Jupyter Community Workshop “Building the Jupyter Community in Musculoskeletal Imaging Research”](#). 30 November 2022. Blogpost on Jupyter Blog in Medium.com.

## PREPRINTS

1. Bonaretti S. et al. (44 authors). [Open and reproducible research in musculoskeletal imaging: Why it matters and how to implement it with the guidelines of the ORMIR community](#). Zenodo. 2025.
2. Bonaretti S. et al. (30 authors). [Introducing the Open and Reproducible Musculoskeletal Imaging \(ORMIR\) community](#). Zenodo. 2023.

## PUBLICATIONS IN PEER-REVIEWED SCIENTIFIC JOURNALS

1. Kuczynski M., Neeteson N., Stok K., Burghardt A., Espinosa Hernandez M., Vicory J., Tse J., Durongbhan P., Bonaretti S., Wong A.K.O., Boyd S., Manske S. [ORMIR\\_XCT: A Python package for high resolution peripheral quantitative computed tomography image processing](#). Journal of Open Science Software, 9(97), 6084. 2024.
2. Ammar A., Bonaretti S., Winckers L., Quik J., Bakker M., Maier D., Lynch I., van Rijn J., Willighagen E. [A Semi-Automated Workflow for FAIR Maturity Indicators in the Life Sciences](#). Nanomaterials, 10, 2068. 2020. (\*co-first author).
3. Bonaretti S., Gold G.E., Beaupre G.E. [pyKNEER: An Image Analysis Workflow for Open and Reproducible Research on Femoral Knee Cartilage](#). PLoS ONE 15(1): e0226501. 2020.
4. Pang E.Q., Coughlan M., Bonaretti S., Finlay A., Bellino M., Bishop J., Gardner M.J. [Assessment of Open Syndesmosis Reduction Techniques in an Unbroken Fibula Model: Visualization vs. Palpation](#). J. Orthop Trauma. 2018.
5. Maier J., Black M., Bonaretti S., Bier B., Eskofier B., Choi J.H., Levenston M., Gold G., Fahrig R., Maier A. [Comparison of Different Approaches for Measuring Tibial Cartilage Thickness](#). J Integr Bioinform. 14(2),1-10. 2017.
6. Bonaretti S., Vilayphiou N., Chan C. M., Yu A., Nishiyama K., Liu D., Boutroy S., Ghasem-Zadeh A., Boyd S.K., Chapurlat R., McKay H., Shane E., Bouxsein M.L., Black D.M., Majumdar S., Orwoll E.S., Lang T.F., Khosla S., Burghardt A.J. [Operator variability in Scan Positioning is a Major Component of HR-pQCT Precision Error and is Reduced by Standardized Training](#). Osteoporos Int. 28(1), 245-257. 2017.
7. Bonaretti S., Holets M., Majumdar S., Lang T.F., Khosla S., Burghardt A.J. [The Comparability of HR-pQCT Bone Quality Measures is Improved by Scanning Anatomically Standardized Regions](#). Osteoporos Int. 28(7), 2115-2128. 2017.
8. Carballido-Gamio J., Bonaretti S., Kazakia G.J., Khosla S., Majumdar S., Lang T.F., Burghardt A.J. [Statistical Parametric Mapping of HR-pQCT Images: A Tool for Population-Based Comparison of Micro-Scale Bone Features](#). Ann Biomed Eng. 45(5), 949-962. 2017.
9. Ghasem-Zadeh A., Burghardt A.J., Wang X.F., Iuliano S., Bonaretti S., Bui Q.M., Zebaze R., Seeman E. [Quantifying Sex, Race and Age Specific Differences in Bone Microstructure Requires Measurement of Anatomically Equivalent Regions](#). Bone. 101, 206-213. 2017.
10. Carballido-Gamio J., Bonaretti S., Saeed I., Harnish R., Recker R., Burghardt A.J., Keyak J.H., Harris T., Khosla S., Lang T.F. [Automatic Multi-Parametric Quantification of the Proximal Femur with QCT](#). Quant Imaging in Med and Surg. 5(4), 552-568. 2015.
11. Bonaretti S., Carpenter D.R., Saeed I., Burghardt A.J., Yu L., Bruesewitz M., Khosla S., Lang T. [Novel Anthropomorphic Hip Phantom Corrects Systemic Interscanner Differences in Proximal Femoral vBMD](#). Phys Med Biol. 59, 7819-7834. 2014.
12. Carpenter R.D., Saeed I., Bonaretti S., Schreck C., Keyak J.H., Streeper T., Harris T.B., Lang T.F. [Inter-scanner Differences in In Vivo QCT Measurements of the Density and Strength of the Proximal Femur Remain After Correction with Anthropomorphic Standardization Phantoms](#). Med Eng Phys. 36, 1225-1232. 2014.

13. Bonaretti S., Seiler C., Boichon C., Reyes M., Büchler P. [Image-based vs. Mesh-based Statistical Appearance Model of the Human Femur: Implications for Finite Element Simulations](#). Med Eng Phys. 36, 1626-1625. 2014.
14. Kistler M., Bonaretti S., Pfahrer M., Niklaus R., Büchler P. [The Virtual Skeleton Database: An Open Access Repository for Biomedical Research and Collaboration](#). J Med Internet Res. 12;15(11):e245. 2013.
15. Schulz A.P., Reimers N., Wipf F., Vallotton M., Bonaretti S., Kozic N., Reyes M., Kienast B.J. [Evidence Based Development of a Novel Lateral Fibula Plate \(VariAx Fibula\) Using a Real CT Bone Data Based Optimization Process During Device Development](#). Open Orthop J. 6,1-7. 2012.

#### PEER-REVIEWED CONFERENCE PAPERS

1. Kistler M., Bonaretti S., Boichon C., Rochette M., Büchler P. **Methods to Accelerate Finite Element Calculations in Biomechanics Using a Statistical Database of Pre-Calculated Simulations**. 10<sup>th</sup> International Symposium on Computer Methods in Biomechanics and Biomedical Engineering. 11-14 April 2012. Berlin, Germany.
2. Bonaretti S., Seiler C., Boichon C., Büchler P., Reyes M. **Mesh-based vs. Image-based Statistical Model of Appearance of the Human Femur: A Preliminary Comparison Study for the Creation of Finite Element Meshes**. Mesh Processing in Medical Image Analysis - MICCAI 2011 workshop. 18 September 2011. Toronto, Canada.
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