



MAHDI HOSSEINITABATABAEI

Presentation Summary

The role of artificial intelligence is rapidly expanding in dental research and clinical practice, from image analysis and decision support to emerging predictive and generative applications. This presentation will provide a perspective on the fundamental principles, current capabilities, and future directions of AI in dental medicine. It will examine current and emerging clinical applications, together with key considerations for translating AI from research to practice, including data, validation, generalizability, privacy, responsible implementation, and integration into research and clinical workflows. Emerging approaches, including foundation models, federated learning, and the integration of AI with biomechanical modelling, will also be discussed.

Curriculum Vitae

Department of Bioengineering, McGill University

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EDUCATION

2023 Ph.D., Biomedical Engineering, McGill University

2018 M.Sc., Biomedical Engineering, University of Saskatchewan

2016 B.Sc., Mechanical Engineering, Ferdowsi University, Mashhad, Iran

RESEARCH

I work at the intersection of artificial intelligence, medical and quantitative imaging, and computational modelling. My research has consistently involved collaboration with healthcare providers to develop reliable methods and tools aimed at improving craniofacial, oral, and bone health. My current work focuses on generative AI for enhancing craniofacial cone-beam CT, AI-assisted image analysis and segmentation, and methods to improve the reliability and quantitative use of medical imaging. I have also gained experience in medical imaging software

development through Cornet Technologies Canada and contribute to open and reproducible imaging research through the ORMIR community.

SELECTED PUBLICATIONS

1. S. Hosseinitabatabaei, A. Nelson, N. Piché, D. Dagdeviren, N. Reznikov, "Craniofacial CBCT: Addressing Volume-Resolution Dilemma using Generative AI", *Bone*, 2026.
2. (alphabetical order) S. Bonaretti, M. Barzegari, ..., S. Hosseinitabatabaei, et al, "Open and reproducible research in musculoskeletal imaging: Why it matters and how to implement it with the guidelines of the ORMIR community," *JBMR Plus*, 2026.
3. S. Hosseinitabatabaei, I. Vitienes, M. Rummler, A. Birkhold, BM. Willie, "Non-invasive quantification of bone remodeling dynamics in adults with OI using time-lapse high-resolution peripheral quantitative computed tomography imaging", *JBMR*, 2025.
4. S. Hosseinitabatabaei, EA. Zimmermann, N. Mikolajewicz, M. Rummler, B. Steyn, C. Julien, F. Glorieux, F. Rauch, BM. Willie, "3D image registration marginally improves the precision of HR-pQCT measurements compared to cross-sectional-area registration in adults with osteogenesis imperfecta". *Journal of Bone and Mineral Research (JBMR)*, 2022.

SELECTED RECENT AWARDS

2026 – 2028 **Postdoctoral Fellowship**, Fonds de Recherche du Québec (FRQS), Amount: \$90,000

2026 – 2028 **Canada Postdoctoral Research Award**, The Canadian Institutes of Health Research (CIHR), Amount: \$140,000

2021 – 2024 **Doctoral Scholarship**, Fonds de Recherche du Québec (FRQS), Amount: \$56,000

TEACHING & ACADEMIC SERVICE

I have lectured in courses on advanced X-ray imaging and finite-element modelling, and have delivered workshops on Python programming. I have also served as Chair of the HR-pQCT Working Group within the Early Career Investigator Committee of the International Society of Bone Morphometry.