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Project Title
Improving bone mineral density estimation from DXA scans of the forearm using AI techniques -facilitating early screening for osteoporosis

Project Summary
Osteoporosis is a bone disease found commonly in post-menopausal women, which costs Australian taxpayers hundreds of millions of dollars per year. Osteoporosis reduces bone mineral density (BMD) which weakens the bones and increases the risk of bone fracture, even from minor falls and stresses. Dual x-ray absorptiometry (DXA) of the hip is considered the gold-standard for BMD assessment; however, only 20% of eligible Australians are using this service, mostly due to the time and effort required to obtain these scans. There is an urgent need for a cost-effective approach that is more accessible to aid in rapid screening for osteoporosis. We aim to test the hypothesis that automated artificial intelligence (AI) techniques can effectively estimate BMD from forearm DXA scans and match the gold standard. This will establish that the wrist is a viable BMD measurement site and pave the way for future research into early screening for osteoporosis using plain peripheral radiography.

Keywords
osteoporosis, artificial intelligence, AI, deep learning, bone mineral density, dual-energy X-ray absorptiometry, DXA, DEXA