Open Research publishing platform

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(1) a centralized, open-access platform for storing and sharing head impact data, in collaboration with the Federal Interagency Traumatic Brain Injury Research informatics system (FITBIR), and (2) a deep learning impact detection algorithm (MiGNet) to differentiate between true head impacts and false positives for the previously biomechanically validated instrumented mouthguard sensor (MiG2.0), all of which easily interfaces with FITBIR. We report 96% accuracy using MiGNet, based on a neural network model, improving on previous work based on Support Vector Machines achieving 91% accuracy, on an out of sample dataset of high school and collegiate football head impacts. The integrated MiG2.0 and FITBIR system serve as a collaborative research tool to be disseminated across multiple institutions towards creating a standardized dataset for furthering the knowledge of concussion biomechanics [1)].

1)
Domel AG, Raymond SJ, Giordano C, Liu Y, Yousefsani SA, Fanton M, Cecchi NJ, Vovk O, Pirozzi I, Kight A, Avery B, Boumis A, Fetters T, Jandu S, Mehring WM, Monga S, Mouchawar N, Rangel I, Rice E, Roy P, Sami S, Singh H, Wu L, Kuo C, Zeineh M, Grant G, Camarillo DB. A new open-access platform for measuring and sharing mTBI data. Sci Rep. 2021 Apr 5;11(1):7501. doi: 10.1038/s41598-021-87085-2. PMID: 33820939; PMCID: PMC8021549.