Characterization of a traveling object with an underground cluster of accelerometers - DTU Orbit (21/10/2019)

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This paper tackled the problem of characterizing an object moving along a surface by means of a buried cluster of accelerometers. Sought characteristics include: path and speed of movement, number and spatial configuration of contact areas, and relative weight distribution across loaded zones. The suggested solution technique was based on solving an inverse problem. For this purpose the passing event was first simulated in a quasi-static mechanical model, and the unknowns were obtained from best matching measured and computed accelerations. The basic solution technique was demonstrated for synthetic acceleration traces generated under ideal conditions. A slightly modified solution technique was proposed for dealing with realistic/field data. Overall, the idea and solution approach are deemed workable, well suited for wireless implementation, and worthy of further development attention.

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