



## **Identification of Possible Velocity Pulses in Earthquake Near Fault Regions by Using Machine Learning**

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Pulse shape ground motions have been identified as imposing extreme demands on structures and they are of interest in the fields of seismology and earthquake engineering. Algorithms are established to distinguish pulse shape signals from ordinary earthquake signal such as Mavroeidis & Papageorgiou, 2003 and Baker, 2007. Baker's algorithm can detect possible pulses and their periods in given waveform by using more convenient methods. We used various parameters such as PGA, PGV, epicentral distance,  $M_w$  along with others and combined them with Baker's algorithm to construct the database. Our database contain near fault waveform of significant crustal earthquakes in hazardous seismic zones. The parameters that we choose to use are easy to determine not only from real earthquake data but also from seismic hazard maps. TensorFlow and Scikit-learn are used in order to process the parameters and establish a reliable algorithm. Both numeric values which are related with earthquake and station position and whole waveform, as numeric and image sense, are used in machine learning. Different algorithms are compared with each other in order to establish a convenient method to understand the possibility of occurrence of pulse shape signals on near fault regions.