

Muon trigger for mobile phones

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The CRAYFIS experiment proposes usage of private mobile phones as a ground detector for Ultra High Energy Cosmic Rays. Interacting with Earth's atmosphere they produce extensive particle showers which can be detected by cameras on mobile phones. A typical shower contains minimally-ionizing particles such as muons. As they interact with CMOS detector they leave low-energy tracks that sometimes are hard to distinguish from random detector noise. Triggers that rely on the presence of very bright pixels within an image frame are not efficient in this case

We present a muon trigger based on Convolutional Neural Networks which play role of trigger sequence and are evaluated in a 'lazy' manner: response of the successive layer is computed only if activation of the current layer satisfy continuation criterion. Usage of the neural networks allows to increase sensitivity considerably. Also this modification allows for execution of the trigger under limited computational power constraint, e.g. on mobile phones.

Secondary Keyword (Optional)

Trigger

Primary Keyword (Mandatory)

Artificial intelligence/Machine learning

Tertiary Keyword (Optional)

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