

## Feature Location Restoration for Under-Sampled Photoplethysmogram Using Spline Interpolation

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**Abstract :** The purpose of this research is to restore the feature location of under-sampled photoplethysmogram using spline interpolation and to investigate feasibility for feature shape restoration. We obtained 10 kHz-sampled photoplethysmogram and decimated it to generate under-sampled dataset. Decimated dataset has 5 kHz, 2.5 k Hz, 1 kHz, 500 Hz, 250 Hz, 25 Hz and 10 Hz sampling frequency. To investigate the restoration performance, we interpolated under-sampled signals with 10 kHz, then compared feature locations with feature locations of 10 kHz sampled photoplethysmogram. Features were upper and lower peak of photoplethysmography waveform. Result showed that time differences were dramatically decreased by interpolation. Location error was lesser than 1 ms in both feature types. In 10 Hz sampled cases, location error was also decreased a lot, however, they were still over 10 ms.

**Keywords :** peak detection, photoplethysmography, sampling, signal reconstruction

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