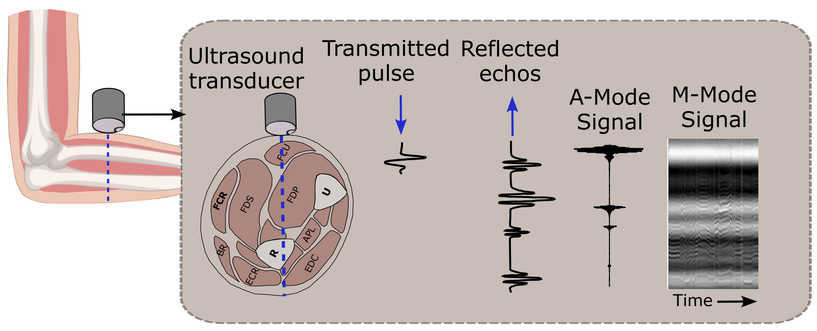
Sonomyography-Based Proportional Control For Isokinetic Movements: A Comparative Analysis of Features and Algorithms

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Introduction

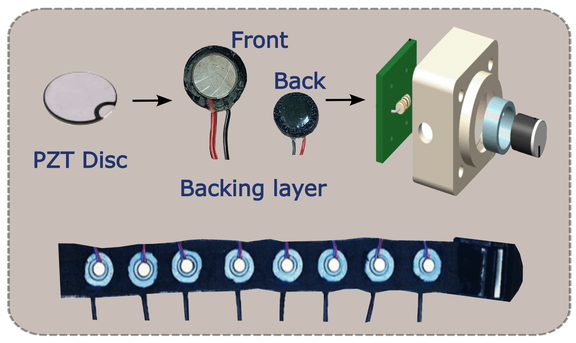


1.) Sound waves emitted by PZT to image internal body structure.

2.) Reflected echoes are used to create real-time images.

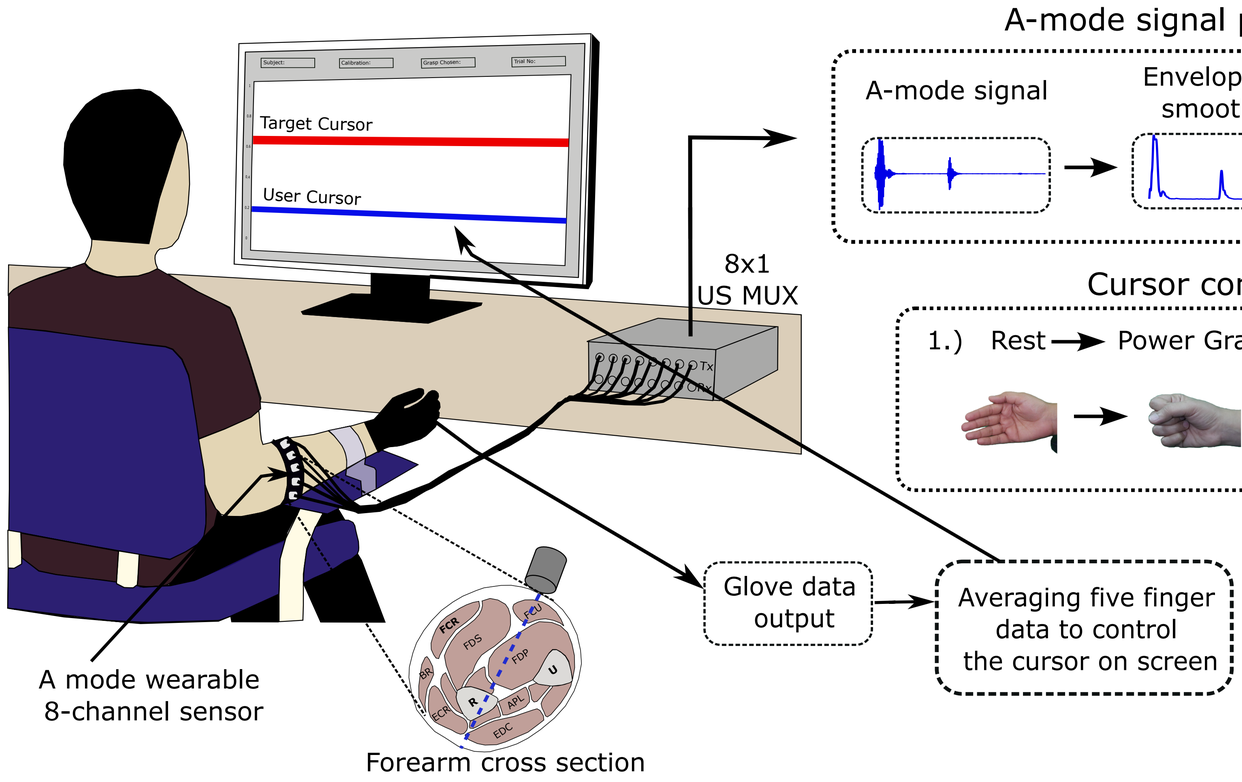
3.) Non-invasive technique

Objective

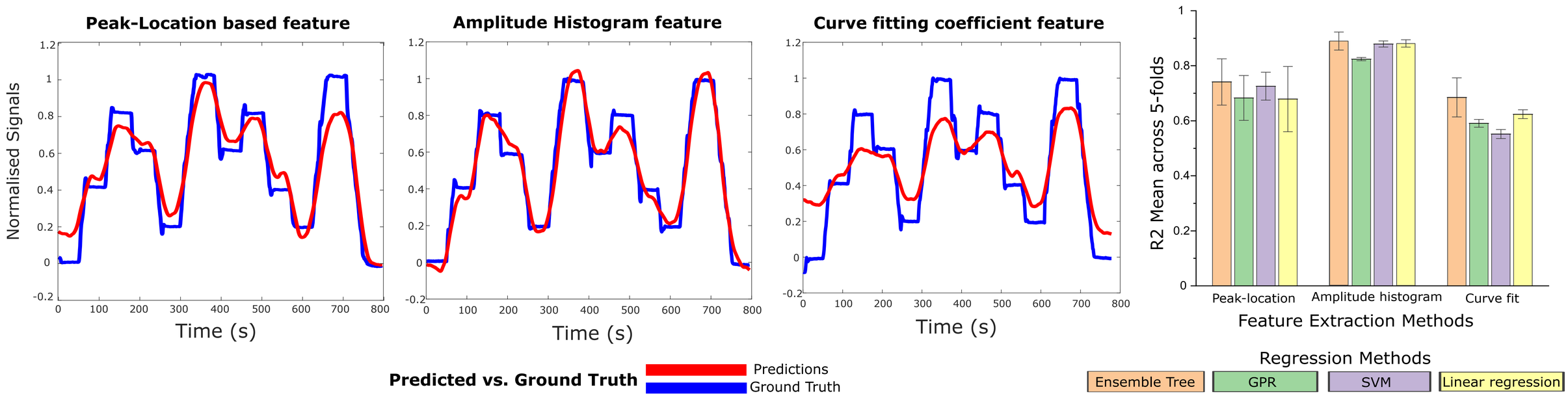


To compare the effectiveness of three feature extraction methods: peak location-based, amplitude histogram, and curve-fitting coefficients, for proportional control using SMG signals, by evaluating their performance in real-time target tracking with various regression models.

Materials and Methods



Results



Conclusion and Limitations

1.) Amplitude histogram features with ensemble regression achieved the highest accuracy (88.72 ± 3.27%) for proportional control, outperforming other methods.

2.) Statistical analysis confirms that feature selection plays a crucial role in model performance and is essential for reliable SMG-based human-machine interfaces.

3.) The study was limited to isokinetic movements with three gestures on healthy subjects, requiring further validation on amputees and broader motion types.

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