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Compact and easy-to-use smartphone based experimental set for studying simple and damped harmonic motion patterns.

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An experimental set for studying harmonic motion patterns was developed in this research. It was designed to be compact and easy to use. It employs sensors in general smartphones to track trajectory patterns of the object moving in both simple and damped harmonic motions. This experimental set can be remotely controlled and collected trajectory data. The data and patterns of trajectory of the studied object can also be real-time displayed and collected by other devices (computers, tablets or smartphones) which students can use for more analysis. Testing the functionality of the presented experimental set, it was found that there was a good consistency between the trajectory patterns collected from the experimental set and simulated from the theory. To evaluate the usage of the experimental set, it was applied to Physics classes. It was found that the students had improved their understanding of harmonic motion pattern by 34.50 percent. These results show that the proposed experimental set can be used for studying harmonic motion patterns effectively.

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