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# DEVICE FOR IMITATION OF STATIC AND DYNAMIC HANDWRITING CHARACTERISTICS

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## WHAT IS THIS PROJECT ABOUT?

THIS PROJECT DEALS WITH DESIGNING AND ASSEMBLING A DEVICE FOR IMITATION OF STATIC AND DYNAMIC HANDWRITING CHARACTERISTICS. THE MOTIVATION ORIGINATES FROM EXPLORING NEW METHODS OF FORGING A SIGNATURE OR PERSON'S HANDWRITING.

### A PEN

WITH ACCELEROMETER, GYROSCOPE (MPU-6050 MODULE) AND MICRO-SWITCH WAS DESIGNED AND ASSEMBLED FOR RECORDING STATIC AND DYNAMIC HANDWRITING CHARACTERISTICS.

### HANDWRITING CHARACTERISTICS

WERE RECONSTRUCTED FROM THE SENSORS' OUTPUT - TRAJECTORY, SPEED AND TILT. DOUBLE INTEGRATION OVER TIME FROM ACCELERATION OUTPUTS DISPLACEMENT, ROTATION MATRIX FROM GYROSCOPE OUTPUTS TILT. COMBINATION OF BOTH PROVIDES ENOUGH DATA FOR TRAJECTORY RECONSTRUCTION..

### BECAUSE OF SENSORS' INACCURACY,

RECONSTRUCTED HANDWRITING WAS MAPPED ONTO REAL HANDWITING'S PHOTO OR SCAN, RESULTING IN ACCURATE TRAJECTORY ALONGSIDE WITH WRITING SPEED AND TILT.

### HANDWRITING WAS IMITATED

BY CONVERSION OF RECONSTRUCTED AND MAPPED HANDWRITING TO G-CODE, FOLLOWED BY EXECUTION WITH SPECIALLY ALTERED 3D PRINTER.