Acoustic signature-based target homing system for autonomous guidance of unmanned aerial interceptors and kamikaze drones consists of acoustic sensor module, signal processing module, digital signal processing computing module, database, comparison module, direction control module, and power supply, wherein acoustic sensor module is designed to receive acoustic signals from aerial target and transmit them to signal processing module. Signal processing module is designed to interface with computing module to perform digital signal processing. Received acoustic signal parameters are transmitted to comparison module, which is designed with the possibility of interacting with database containing a collection of acoustic signatures. Comparison module is designed with the possibility of performing correlation analysis between the received signal characteristics and reference signatures from database. Direction control module is designed to guide unmanned aerial interceptors and kamikaze drones toward the target.