

# A-BiRD: Automated Bird Recognition Device — Revolutionizing Ornithological Research for Global Bird Conservation

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The global bird population decline due to climate change, pollution, and habitat destruction is a critical challenge. Addressing this global issue is vital for biodiversity preservation and understanding environmental changes. Reliance on inconsistent, often citizen-sourced data hinders accurate tracking of avian declines. The presence of humans collecting data directly affects bird behavior and produces data of variable quality. A-BiRD addresses these challenges. It's data and analysis yields insights into species preferences, habitats, and bird migration patterns without human intervention. It employs Cornell University's BirdNET-Analyzer for identification and cueing, its own algorithm for direction finding, and pandas for data processing, graphing, and analysis. In a Tucson field study from 09/2023 to 01/2024, two A-BiRD devices successfully collected unbiased data, revealing insights into bird diversity and behaviors during Fall Migration. Accurate species identification and triangulation occurred even with multiple simultaneous bird songs. A total of 98 different bird species and 21,131 combined birdsong events were identified. The study's conclusions highlight changing migration patterns, peak activity periods, and shifts in daily bird species dominance. Ongoing research and testing are shaping A-BiRD into a practical tool. This positions it as an innovative device that unites communities in safeguarding global bird diversity. Leveraging Arizona's diverse ecosystems, A-BiRD presently contributes locally with immediate impacts on avian research in Southern Arizona. Looking forward, A-BiRD devices hold the potential to address broader environmental challenges, making a significant impact on both local and global bird conservation efforts.