Abstract

VisionDeck Pro is an advanced real-time computer vision system designed to accurately detect and recognize playing cards using state-of-the-art deep learning. Built on the YOLOv8 architecture and optimized for practical deployment, the system delivers robust performance across varying lighting conditions, card orientations, and camera qualities. VisionDeck Pro identifies all **52 standard playing cards** with high precision, enabling seamless integration into gaming automation, digital casinos, training tools, and computer-assisted gameplay environments.

The platform features a streamlined **Streamlit-based interface** for effortless user interaction, paired with a highly optimized detection pipeline that performs multi-frame aggregation to maximize prediction confidence. VisionDeck Pro leverages both **synthetic and real-world datasets**, incorporating more than 20,000 training samples to ensure strong generalization and production reliability. The architecture supports modular model switching, GPU acceleration, and flexible configuration, making it adaptable for research, embedded systems, and commercial applications.

Designed with scalability, performance, and usability in mind, VisionDeck Pro demonstrates how modern AI-driven visual recognition can enhance traditional gaming experiences while enabling new possibilities in automation and intelligent decision systems.

Keywords: Playing card detection, real-time object recognition, YOLOv8, computer vision, deep learning, AI-based card recognition, multi-frame aggregation, synthetic datasets, Streamlit interface, automated gameplay analysis.