# Neural Network Architectures for Autonomous Drone Navigation

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**Abstract.** The development of autonomous drones hinges on advancements in neural network architectures that can process complex environmental data in real time. This paper discusses innovative neural network models tailored for autonomous navigation, enabling drones to make split-second decisions and navigate safely through dynamic environments. By leveraging deep learning techniques, these models improve path-planning and obstacle avoidance capabilities. The research includes a series of experiments comparing traditional navigation systems with the proposed neural models, highlighting significant enhancements in performance and reliability.

**Keywords:** drone, neural, navigation, autonomous, learning

**Introduction:** Autonomous drones are at the forefront of technological innovation, with applications spanning from delivery services to surveillance and agricultural monitoring. A critical component of drone autonomy is the ability to navigate complex environments safely and efficiently. Current navigation systems often fall short in dynamic and unpredictable settings. This paper presents cutting-edge neural network architectures designed to process and interpret real-time environmental data, facilitating effective autonomous navigation. The proposed networks enhance drones' path-planning and obstacle avoidance capabilities, crucial for operating in varied and challenging conditions. Our comparative experiments demonstrate a marked improvement in performance over traditional systems.

## References

1. Kumar, N., & Kataria, V. Enhanced Sentiment Classification using a Multi-layered Stacked Ensemble Architecture.