Optical Flow Visual Obstacle Avoidance Module



Overview

GitHub - yudhisteer/Optical-Flow-Obstacle-Avoidance-for-UAV: In this project I aim to develop an unsupervised sense-and-avoid system for UAVs using sparse and dense optical flow. · GitHub Designing a sense-and-avoid system for UAVs that can effectively detect and track all obstacles poses a. Optical flow captures the motion of pixels in an image sequence over time, providing information about movement, depth, and environmental structure. Flying insects utilize this information to navigate and avoid obstacles, allowing them to execute highly agile maneuvers even in complex environments. In addition, most approaches are unable to deal with. This study proposes an innovative deep reinforcement learning (DRL) framework that leverages multimodal perception through the fusion of LiDAR and depth camera data. This unsupervised approach focuses on the movement characteristics to identify potential obstacles.

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Article Content

Visual obstacle avoidance technology of VSLAM indoor ...

This research primarily focuses on acquiring environmental information by integrating optical flow and feature extraction techniques.

Optical Flow Obstacle Avoidance for UAV

To address this gap, we propose a lightweight, bio-inspired framework that enhances obstacle awareness through visual appearance cues. As illustrated in Figure 1, the framework

Seeing Through Pixel Motion: Learning Obstacle Avoidance from

Our real-world demonstrations indicate that optical flow is an effective representation for obstacle avoidance as it encodes valuable information about the vehicle motion and the surrounding

A Lightweight UAV Visual Obstacle Avoidance Algorithm

Based on this, we designed a visual obstacle avoidance algorithm that can improve the obstacle avoidance performance of UAVs in different environments.

Real-Time Obstacle Avoidance Using Monocular Depth

The proposed approach integrates Farneback''s method for optical flow analysis with a monocular depth estimation model using MiDaSv2.1 for

Vision-Based Obstacle Avoidance Strategies for MAVs

To address these limitations, this paper proposes a vision-based obstacle avoidance algorithm for MAVs using the optical flow in 3-D textured environments. The

DRL-Based UAV Autonomous Navigation and Obstacle

Simulation experiments validate that the proposed framework significantly enhances both sample efficiency and obstacle avoidance

Optical Flow Obstacle Avoidance for UAV

This solution adapts to a wide range of unforeseen objects, enhancing collision avoidance and flight path planning. Our research delves into optical flow techniques to determine their effectiveness in

Seeing Through Pixel Motion: Learning Obstacle Avoidance From

Optical flow captures the motion of pixels in an image sequence over time, providing information about movement, depth, and environmental structure. Flying insects utilize this

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Adaptive Visual Servoing for Obstacle Avoidance of Micro Unmanned ...

Section3describes the obstacle avoidance flight strategy with optical flow and the considered problems. Here, we also propose visual servoing and adaptive control of the switching system for

mathworks-robotics/obstacle-avoidance-using-camera

This submission contains the implementation of optical flow algorithm for obstacle avoidance. Here, the drone to traverses through a Simulink® 3D

Optical Flow based robot obstacle avoidance

The optical flow provides very important information about the robot environment, like: the obstacles disposition, the robot heading, the time to collision and the depth.

Optical flow based mobile robot obstacle avoidance method in ...

In order to solve the obstacle avoidance problem in complex unstructured environment, inspired by the optical flow navigation strategies of insects, an algorithm of visual obstacle avoidance

Vision Based Obstacle Avoidance Techniques

There are two fundamental groups of vision based obstacle avoidance techniques; those that compute the apparent motion, and those that rely on the appearance of individual pixels for monocular vision

Visual-based obstacle avoidance method using advanced CNN for

When reaching its goal, the mobile robot slows down while avoiding obstacles and calculates a path to reach its destination . Mobile robots use sensors to avoid obstacles. These

Optical Flow-Based Obstacle Detection for Mid-Air Collision Avoidance

This paper describes the development of an optical flow-based airborne obstacle detection algorithm to avoid mid-air collisions. The approach uses the visual information from a

OAOF-Obstacle Avoidance using Optical Flow

The suggested system''s findings demonstrate that using a camera sensor with the optical flow algorithm may be a useful tool for obstacle avoidance

Vision-Based Obstacle Avoidance Strategies for MAVs Using Optical Flows ...

This paper proposes a vision-based obstacle avoidance algorithm for MAVs using the optical flow in 3-D textured environments that is capable of avoiding wall-like frontal obstacles and

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