

Virtual 3D Environments for Image-Based Navigation Algorithms

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Abstract : This paper applies to the creation of virtual 3D environments for the study and development of mobile robot image based navigation algorithms and techniques, which need to operate robustly and efficiently. The test of these algorithms can be performed in a physical way, from conducting experiments on a prototype, or by numerical simulations. Current simulation platforms for robotic applications do not have flexible and updated models for image rendering, being unable to reproduce complex light effects and materials. Thus, it is necessary to create a test platform that integrates sophisticated simulated applications of real environments for navigation, with data and image processing. This work proposes the development of a high-level platform for building 3D model's environments and the test of image-based navigation algorithms for mobile robots. Techniques were used for applying texture and lighting effects in order to accurately represent the generation of rendered images regarding the real world version. The application will integrate image processing scripts, trajectory control, dynamic modeling and simulation techniques for physics representation and picture rendering with the open source 3D creation suite - Blender.

Keywords : simulation, visual navigation, mobile robot, data visualization

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