

Title:

Project Westdrive: an open Unity city for virtual reality studies.

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Abstract:

Virtual environments are likely to alter the way we conduct scientific studies on human behavior. Possible applications of virtual environments range from spatial navigation over addressing moral dilemmas in a more natural manner, to therapeutic applications for affective disorders. The decisive factor for this broad range of applications is that virtual reality (VR) is able to combine a well-controlled experimental environment together with the ecological validity of the immersion of test subjects. Until now, however, programming such an environment in Unity® requires profound knowledge of C# programming, 3D design and computer graphics. In order to give interested research groups access to a realistic VR environment which can easily adapt to the varying needs of experiments, we developed a large, open source, scriptable and modular VR city. It covers an area of 230 hectare, up to 150 self-driving vehicles and 655 active and passive pedestrians and thousands of nature assets to make it highly dynamic and realistic. Furthermore, the project presented here contains a stand-alone City AI toolkit for creating avatars and customizing cars. Finally, the package contains code to easily set up VR studies. In summary, the project named Westdrive is developed to enable research groups to access a state-of-the-art VR environment that can be adapted to specific needs and allows focus on the respective research question.