Project Manager

Thursday, June 23, 2022 5:26 PM

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Operational Intel and Essential Notes:

- Use Jupyter notebook to communicate with real robots
- Should we use Nvidia Isaac Sim?
- Nvidia vs Unity:
  - Nvidia products are increasing becoming superior solution for the robotic controller training data problem. They have a number of key advantages that allows them to deliver higher performance. These advantage include:
    - SOTA rendering hardware and software
    - Industry partnership for better data collection and toolchain dev
    - Trusted name helps with widespread adoption
    - Integrated and ready DL solutions
    - Integrated ROS and hardware extensions
    - Better developed digital twin ecosystem (omniverse)
    - Higher engineering bandwidth for faster and better engineering dev

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ToDo (General):

- Paper:
  - Related work
- Experiment setup
  - Digital twin
  - Dataset

ToDo (Bardia):

- Write every day – Next
- Omniverse: setup on TACC – Next
- Setup VNC remote access

ToDo (Linus):

- Port UR5 into Unity – done
- Try to install Omniverse – done
- ROS2 tutorials – Next
- MoveIt tutorials
- TurtleBot tutorials

ToDo (Maicol):

- ROS2 tutorials – done
- MoveIt tutorials – done
- VNC setup – tried (needs assistance)
- TurtleBot tutorials – Next

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DLO Project Goals and Scope:

- Approach:
  - A Robotics Revolution with NVIDIA Orin (GTC November 2021 Keynote Part 7)
- Similar:
  - Mujoco and Unity Robotic Arm Simulator Project

Robotics Dev Toolchain and Strategy:

- NVIDIA and ROS Team Up To Accelerate Robotics Development | Ep. 340

Software Dev Methodology:

- https://www.orientsoftware.com/blog/list-of-object-oriented-programming-languages/
- https://www.orientsoftware.com/blog/benefits-of-agile-methodology/

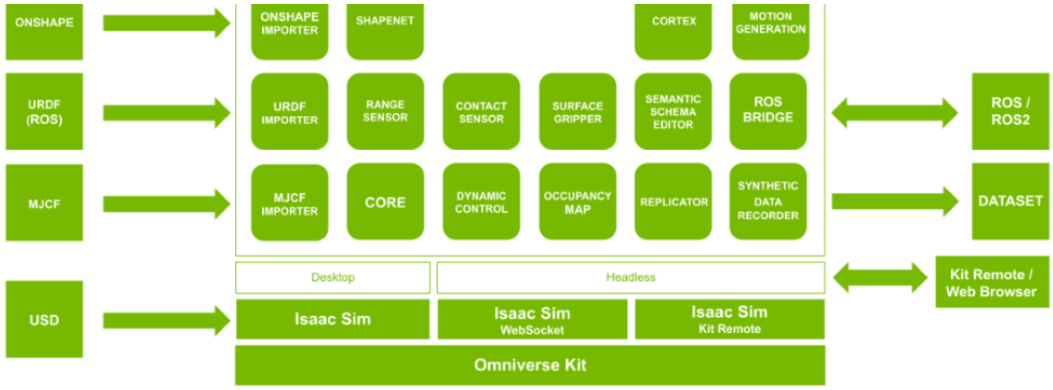
Omniverse:

- Docs: https://docs.omniverse.nvidia.com/py/kit/index.html

Isaac Sim:

- Intro: Introduction and Live Demo in Isaac Sim - Community Stream
- Digital Twin: Robot Autonomy with the Digital Twin in Isaac Sim
- Installation: https://docs.omniverse.nvidia.com/app_isaacsim/app_isaacsim/install_basic.html
- Doc: https://docs.omniverse.nvidia.com/app_isaacsim/app_isaacsim/overview.html#documentation-overview
- System architecture: ---------->>
  - High degree of core middle-ware integration into omniverse

System Architecture



- Developer forum: https://forums.developer.nvidia.com/c/agx-autonomous-machines/isaac/67

Unity:

- Installation:
  - https://unity3d.com/get-unity/download
- Basics:
  - LEARN UNITY - The Most BASIC TUTORIAL I'll Ever Make
- Docs:
  - https://docs.unity3d.com/Manual/index.html
- Key binding cheat sheets:
  - https://cheatography.com/narren/cheat-sheets/unity-3d-engine/
- C# cheat sheets:
  - https://cheatography.com/tag/unity/ <<-----(1)
  - https://blog.devgenius.io/unity-3d-c-scripting-cheatsheet-for-beginners-be6030b5a9ed
  - https://www.raywenderlich.com/227-unity-cheat-sheet-and-quick-reference-2018
  - https://gist.github.com/samsheffield/96608e465091069d15fdaea29457ec85
  - https://dev.to/codemaker2015/unity-3d-c-scripting-cheatsheet-for-beginners-34f8
- VSCode Extension:
  - C# core with .NET support
  - C# Unity snippets
  - C# Unity intellisense
- **Unity ROS Robot control**
  - How to Setup Unity and ROS2 in less than 5 minutes!
  - Unity Robotics Hub: The Spot Robot Controlled Using ROS
  - UR5 for Unity: https://github.com/qian256/ur5_unity
  - Import robot model into Unity: ROS#: Robot Model Import to Unity

MuJuCo:

- Installation: How to Install Mujoco and Mujoco-py on Ubuntu
- Docs:
- Basics: