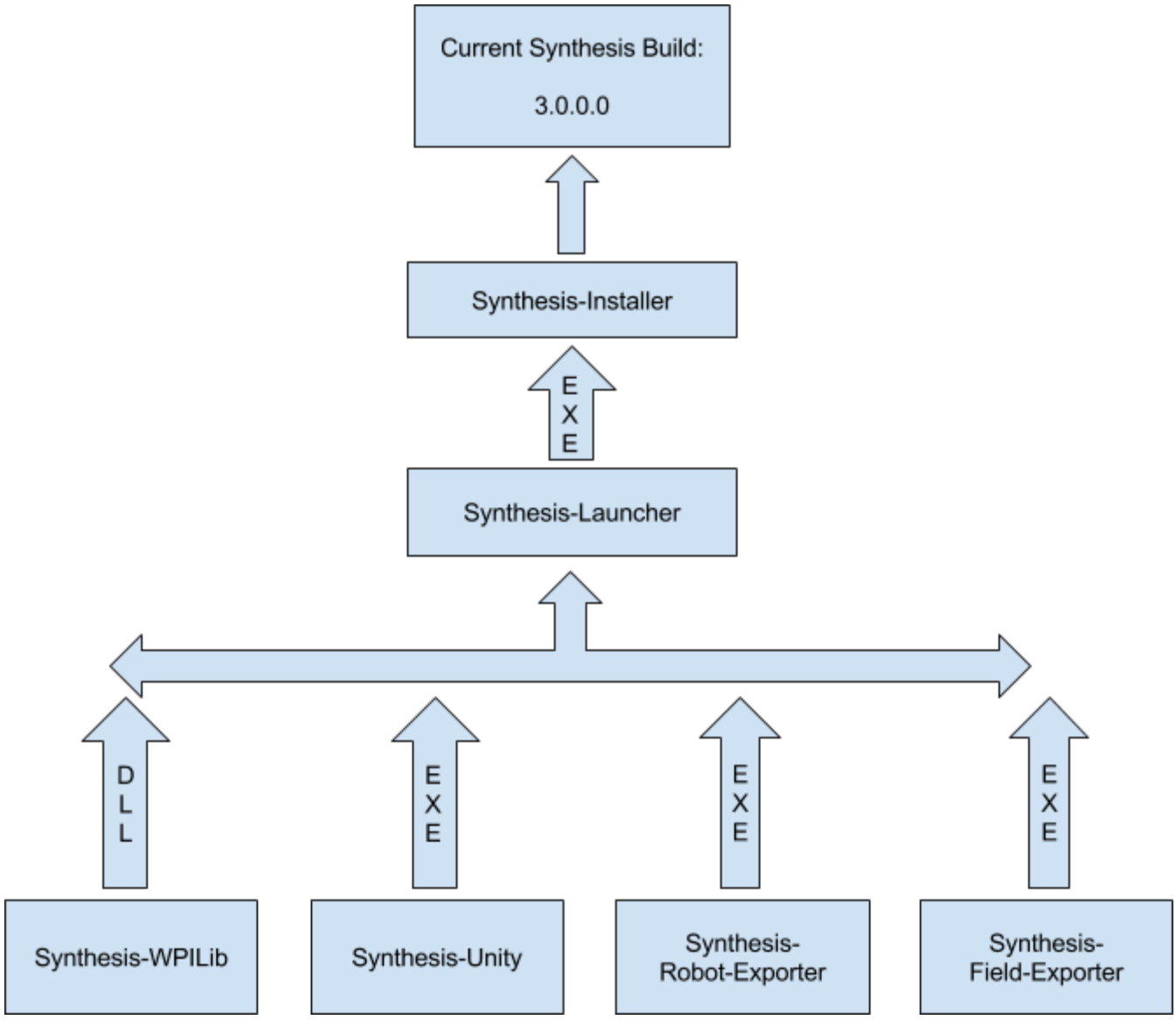
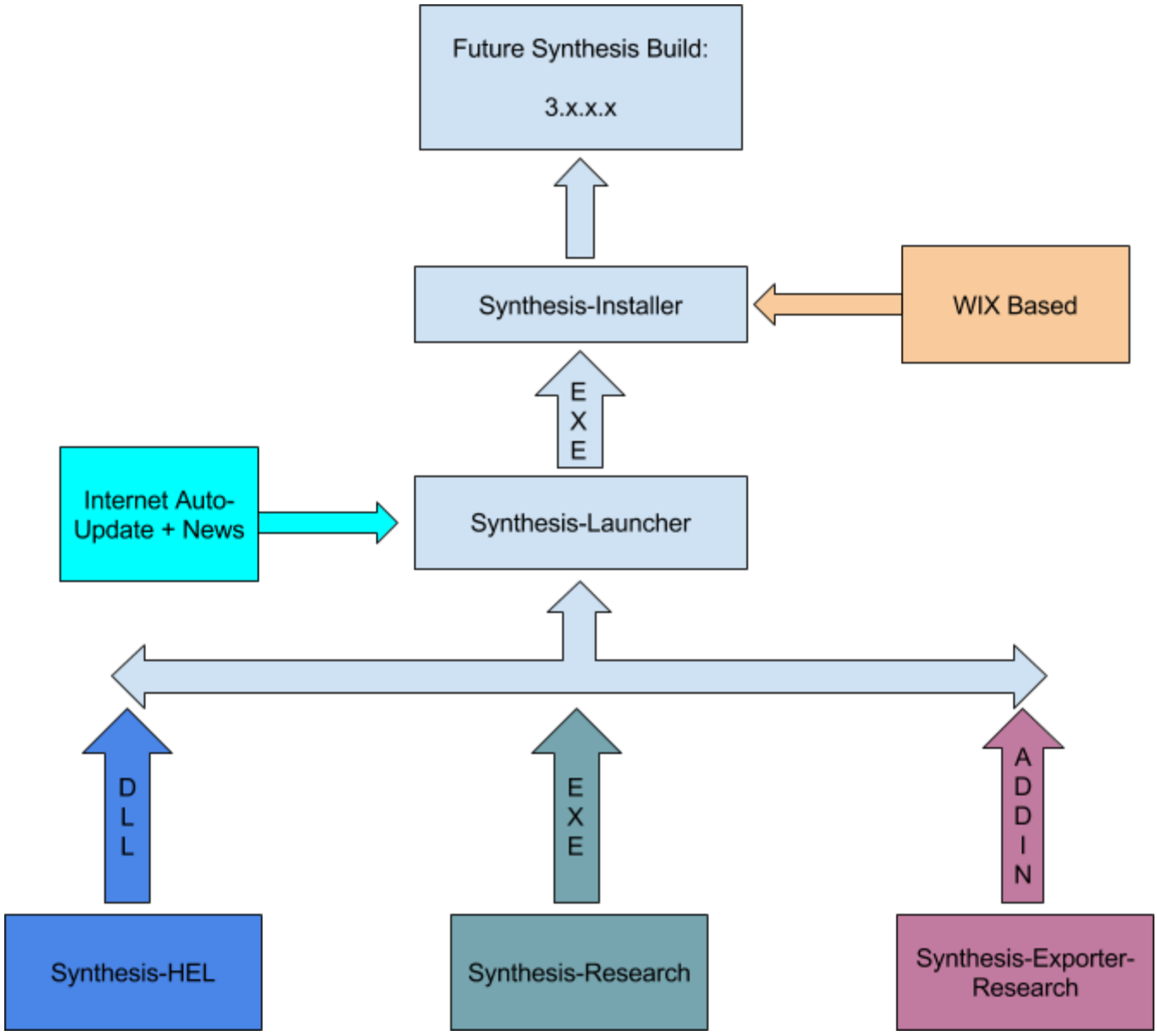
Autodesk Synthesis Git Workflow



Currently the Github repositories contain the information that one would need to fully compile the current version of our product on their own. This workflow is shown by the above diagram and hierarchy. Our roadmap that is shown below represents our future goals and how we hope to achieve them as well as the workflow for the current objectives.

Future Plans and Roadmap



For the future of Synthesis we want a more friendly and easy to use program so that students will not have to spend a large amount of time trying to understand the different components of the program. We hope by releasing our current researched repositories it may inspire someone to continue development on the product and allow the community to truly contribute to it's success.

In order to accomplish this we plan to integrate the following features in the future plans for Synthesis:

1. Synthesis-Unity needs to be scrapped in order to create a new engine that can fully utilize a physics library, such as Bullet Physics. This is where our Synthesis-Research repository comes in; some of our developers worked with OpenTK and Bullet Physics in order to create a basic engine that allows for large scale customization on our behalf.

2. Synthesis-WPILib was a very ineffective way for us to emulate the code and translate it into commands for the simulator, this is why we chose to do a emulated hardware layer for convenience's sake. Synthesis-HEL is the HAL layer implementation for our simulator and will replace the previous libraries we generated. We will continue to investigate better methods of emulation regardless of current research path if one presents itself. More information can be found in the branches of this repository.

3. Synthesis-Exporter-Research is our largest change in the current workflow of Autodesk Synthesis. This is a complete reintegration of the Exporters into a single exporter inside of Inventor via a addin that the can user can integrate straight into their InventorPlugin folder located in appdata in order to export a robot/field using the settings in the custom ribbon tab we will create. This section of future development is the furthest on the way and will continuously be developed until it can replace the current method for exporting. Within the same repository we are also investigating new methods of file saving for the simulator, our old XML/Binary files were large and ineffective in the long run.

4. Currently there is a plan to completely rewrite the current launcher that is contained inside of Synthesis-Launcher so that it can be more representative of our application and time spent on development. We eventually may abandon this if the exporters become a plugin. Things we want to include in our new Launcher:
    a. Auto-Update retrieval from web server information
    b. News retriever from web server
    c. Better overall look and design

5. Synthesis-Installer will be overhauled in the coming months using a new system that is currently being researched. We felt that Installshield wasn't an effective way for our users to install the application and again did not really represent the time we spent on the development of the project as a whole. Currently we are focusing on using WIX for building the application's installer.

Other Plans:

- Multiplayer: Likely a feature to be added post new engine development
- Points Scoring: Feature to be added into the field exporter
- In-Game DriverStation: Way in the future