PIP Review: Brett Stephens

Improvements:

- **Communication:**
  - Continued discussion of and engagement with technical topics until a mutual understanding of said topic is reached among all involved.
  - Clearly articulate what problem I'm solving and what my approach is. Ensure the team is aware of the problem and my approach. Be open to amendments to said approach and adapt quickly/effectively to changes.
  - Not being afraid to push back if appropriate and not retreating from a discussion when ambiguity/disagreement is present.
- **Task Management**
  - Not getting "bogged down" on a particular task (e.g. impedance controller implementation).
  - Ability to be adaptable: switch tasks based on high-priority issues as they arise in real time
  - Minimize feature integration time and thoroughly test features before running it on the robot

Contributions: lead the effort for consistent feature testing and develop/facilitate solutions for all systems-level problems

- **6/10/2025 – S**hop
  - **Aruco detection API**: integration API into control and joystick binaries and debug all integration issues (alpha filtering for state estimates, incorporating multiple Aruco detections
  - Implement Aruco localization camera calibration and scene configuration (Aruco map)
  - Propose integration of Cartographer using ROS (decrease implementation time)
- **13/10/2025 – S**hop
  - Advocate for outsourcing the crating of the robot and locate company to provide crate and pack the robot
  - Logistics for Hamilton
  - **UR control box setup for the shop (VPN, on/off switch, e-stop and dead-man switch)**
- **20/10/2025** – Hamilton
  - **Bring-up** robot pc, in-cart camera bring-up (OG reconfigure and test), pressure sensor bring-up
  - Pick perception camera bring-up and bag detection test
  - Aruco installation, wire routing for all 3 cameras, scene measurements
  - Pick camera calibration
  - Pressure/range sensor bring-up
- **27/10/2025** – Shop
  - **Develop, implement and test click2filter**
  - Bring-up of shop robot (install Realsense, pedestal on to the Invio, CAN communication, etc.)
- **03/11/2025** – Shop + Hamilton
  - Perception logging refactor
  - **Develop, implement and test click2pick**
  - Refactor camera calibration, calibrate cameras, belt mask segmentation

- **10/11/2025** – Hamilton
  - Testing and prepping for the demo with ZIP
  - Assignment and taking on of role testing AND systems-level trouble shoot leader
  - **Facilitate/implement changing motion scheme** (i.e. no longer travel through "home"). Work with Preet to implement this (building parts of the new motion scheme individually)
  - Lead organization and tracking of all Hamilton-based critical tasks
  - Improve UR sim usability (auto-homing)
- **17/11/2025** – Hamilton
  - **Proposition for 2D BEV pick perception**
  - ID Invio velocity error resulting in control node failure.
  - Work on placement pipeline, liaise Hamilton issues to Preet and work to solve all place motion issues/bugs.
  - Highlight need for MCAP changes (reduce "insider knowledge")
  - Lead testing in an attempt to push Hamilton robot to a "tag-able" pipeline state from which we can consistently test from
  - Setup of birds-eye-view camera and svo recording ability while on Thanksgiving break

Future (ownership and role development):
- **Testing:** Continue taking leadership on feature testing and systems-level problem solving
- **Control**: impedance controller - testing current implementation and taking lead on impedance controller refinement (moving this out of urscript)
- **Localization:** Non-aruco (e.g. Lidar) localization: Aruco viability for future deployments?
- **Perception:** In-cart OG and grasp perception development