What is ROS?
The Robot Operating System (ROS) is an Open Source Software project (OSS) featuring a flexible communications platform that is generalized for use on any robot system. ROS developers contribute code and time to create, fix, and improve packages, and metapackages, which solve specific functions for specific systems, and are shared freely.

What is the ROS Ecosystem?
The ROS ecosystem is comprised of the users and developers that utilize, improve, and interact which drives the development and adoption of ROS. The ecosystem of any OSS project determines the success and lifetime of the project. If the project were to lose too many users, it is likely developers would lose motivation to contribute to the project. Similarly, if developers are not engaged or responsive enough, users will likely leave the project because it will lack the functionality and usability that they are seeking.

What Improvements?
ROS Social Site:
A social networking site tailored to ROS members to track relevant metrics, including ROS Impact Score. The site would also promote networking by allowing the easy tracking and contacting of other ROS users.

ROS Impact Score:
A score that is determined by examining the package’s use on robot systems. It is also a result of the package’s dependencies on other packages.

Goal:
To analyze the ROS ecosystem to determine if the ecosystem is a good candidate for the proposed improvements.

Analysis:
Community Health: Data relating to user membership and question responsiveness will be studied to assess the health of the ROS community.
Developer Engagement: Contributions and attribution will be evaluated to determine the amount of engagement of developers.
Research Impact: Utilizing ROS Palantir, a relative impact metric will be assigned. This metric represents the importance of a package.
Research Collaboration: Package contributions will be evaluated for collaboration. The relative collaborativeness of developers will be ascertained.
Research and Social Networking: The data will reveal the number of developers a developer has worked with on a package. This will be evaluated for networking beyond group and organization boundaries.

Methods:
Utilize web scraping and available web service APIs to gather data necessary for the study. The sites that will be used for the gathering of data are:
ROS Answers: This site contains information specific to user and developer membership.
ROS Wiki: This site contains information regarding package dependencies, package authors and maintainers.
GitHub: This site contains information regarding group and organization affiliation. In addition, it also contains information regarding code contributions.
ROS Palantir will be used to determine the impact of each package by evaluating its dependencies and usage.

Future Work:
This project currently evaluates the suitability for ROS to receive the proposed improvements. Another study that implements the improvements would be invaluable as an interaction assessment tool. This study would be able to better determine if the improvements to ROS would result with the intended outcome.

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NSF REU Site: Robots In the Real World
OREGON STATE UNIVERSITY ROBOTICS
ENGAGE
- Community Health
- Developer Engagement

INCENTIVIZE
- Research Impact
- Research Collaboration
- Research and Social Networking

IMPROVEMENTS
- Increased:
  - Membership
  - Membership Lifespan
  - Developer Engagement
  - Networking
  - Package Creation and Enhancement
  - Adoption of ROS

Analysis captures current and trending conditions of ROS Community

Increased:
- Membership
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Analysis conducted will provide basis and strength of recommendation for improvements to ROS Community