# Supporting Extensive Livestock Farming with the use of Autonomous Intelligent Robots

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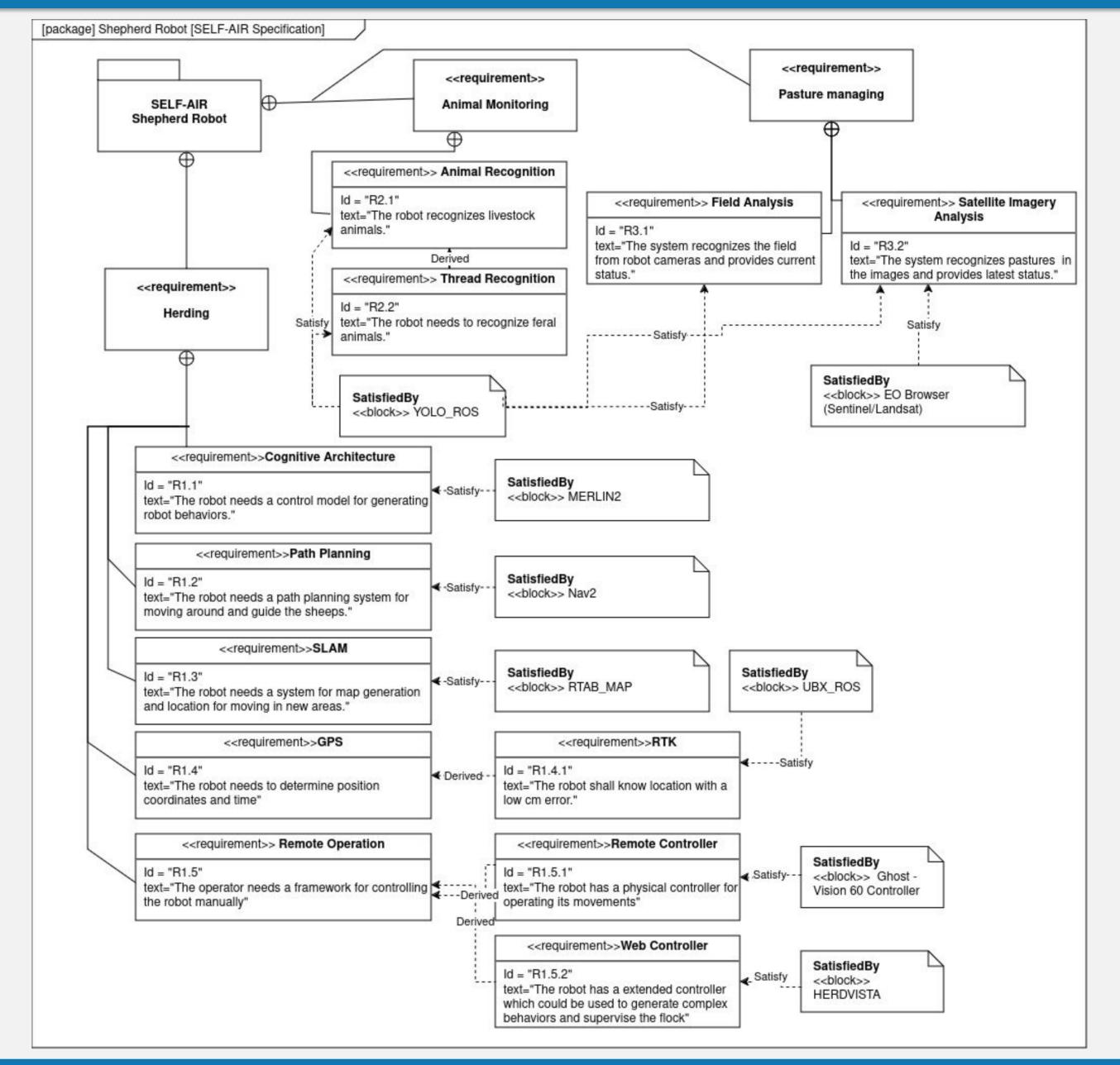
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#### Introducción

The livestock industry faces significant challenges, labor-intensive management, threats from including predators, and concerns regarding environmental sustainability. In response, this paper investigates the integration of quadruped robots into extensive livestock farming as a novel field robotics application. At the forefront of this innovative approach is the SELF-AIR project, an acronym for Supporting Extensive Livestock Farming with the Use of Autonomous Intelligent Robots. Equipped with advanced sensors, artificial intelligence, and autonomous navigation systems, these robots demonstrate exceptional capabilities in traversing diverse terrains, monitoring large herds, and assisting in a variety of farming operations. This paper provides comprehensive overview of the SELF-AIR project, highlighting the valuable lessons learned throughout its development.

### Requeriments



The SELF-AIR project Supporting Extensive Livestock Farming with the use of Autonomous Intelligent Robots showcases how autonomous robots can significantly enhance the efficiency and sustainability of extensive livestock farming practices. The project started in December 2022 and finishes November 2024.



#### Farms





#### Requeriments

Minimal set of requirements for: 1) herding, 2) predator monitoring, and 3) pasture managing.

Capabilities

=⇒ [R1.1], [R1.2], [R1.3] Cognitive Architecture, Path

## Conclusions

This study highlights the critical need for precise planning, robust design, and ongoing adaptation to successfully integrate quadruped robots into livestock management. Despite challenges such as terrain navigation and animal behavior, our results demonstrate the potential of robotics to improve farm efficiency, productivity, and animal welfare. Future research should focus on advancing the autonomous capabilities of these robots and enhancing performance in farming.

#### Planning, SLAM

=⇒ [R1.4, R1.4.1] GPS, GPS+RTK.

=⇒ [R2.1], [R2.2] Animal, Threat recognition.



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