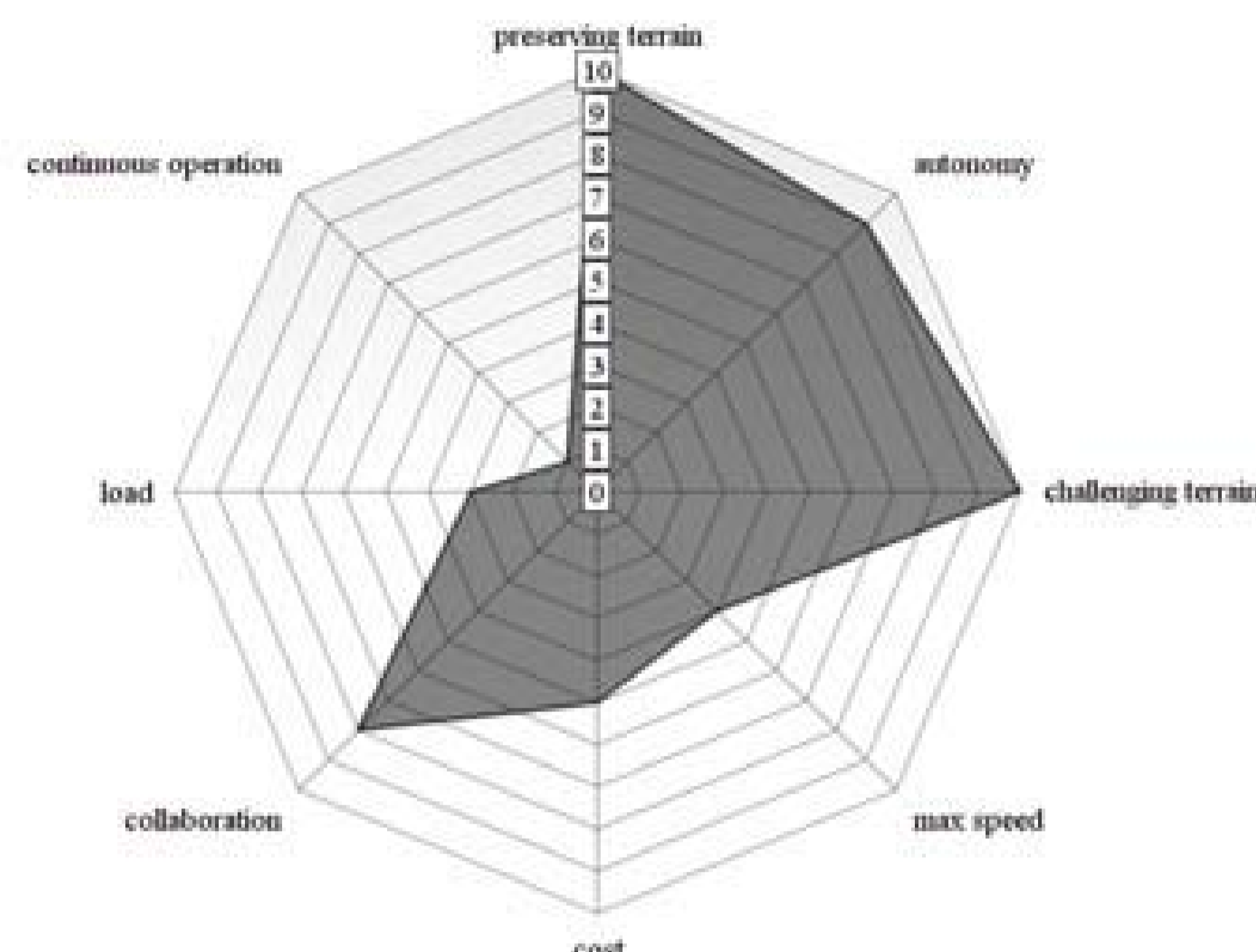


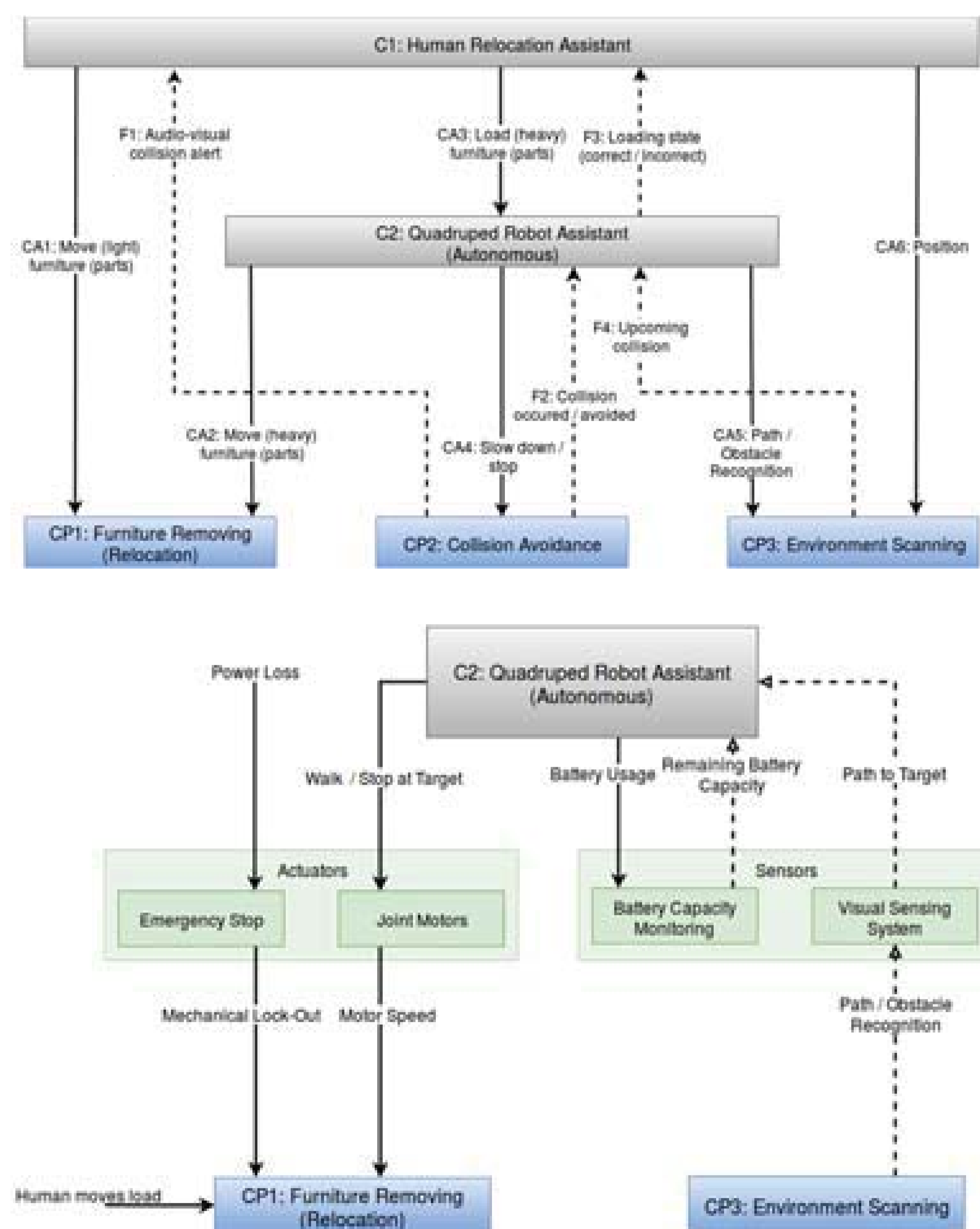
Generating Research Aims for Legged Robots: A Market and Dependability Approach

2 Competitor Analysis



Unique selling proposition: Quadruped robots have clear advantages in autonomy, difficult terrains and causing less damage to the terrain compared to wheeled and tracked robots.

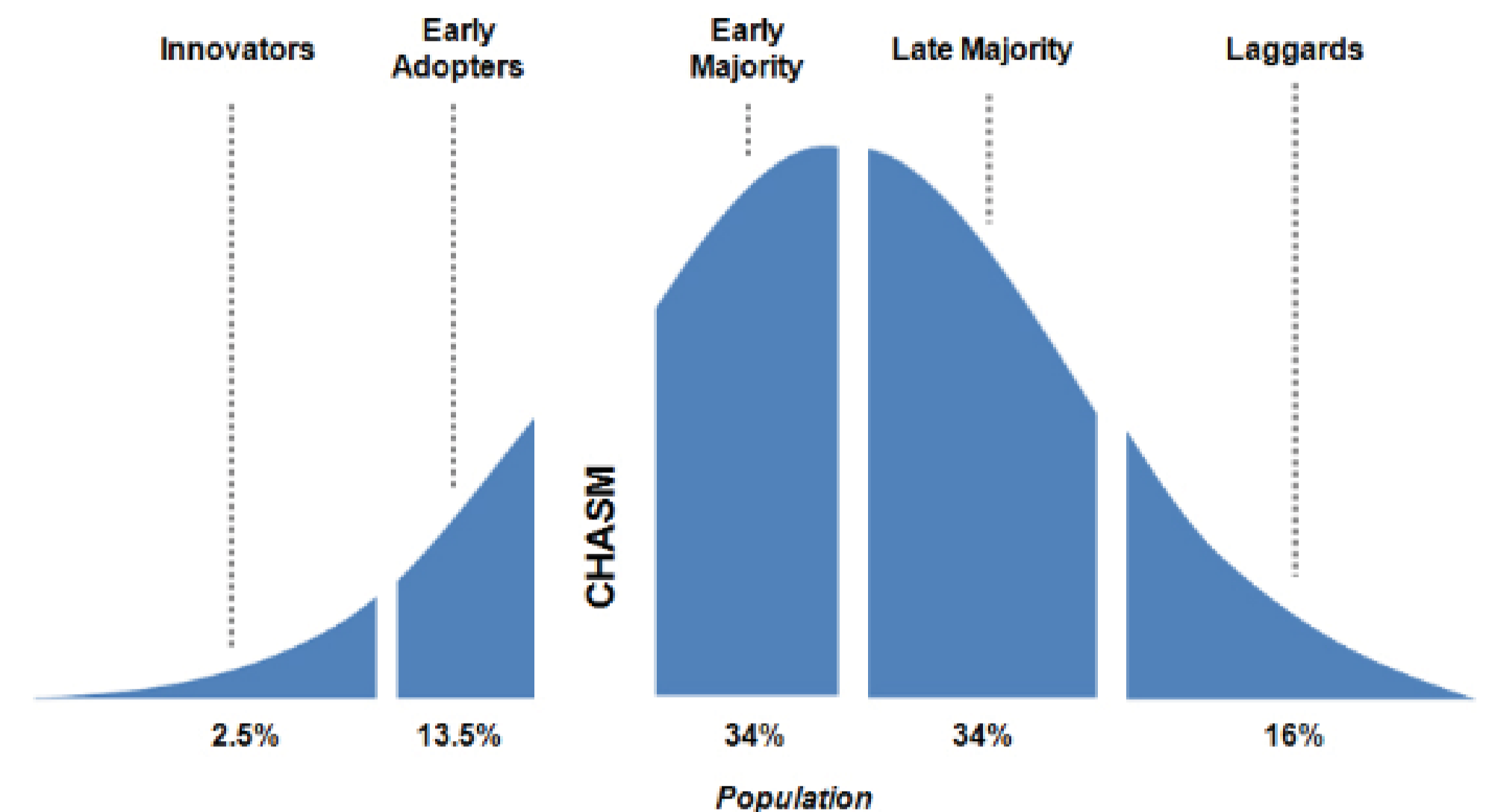
4 Development of Controller Architectures using System Theoretical Process Analysis (STPA)



Problem: Ensure functional safety of quadruped robot using STPA

- Functional Model of complete system represented by hierarchical control structure (HCS)
- Deeper Analysis performed in controller architecture of (unsafe) control actions (CA)

1 Position within Adoption Cycle



Target Market:

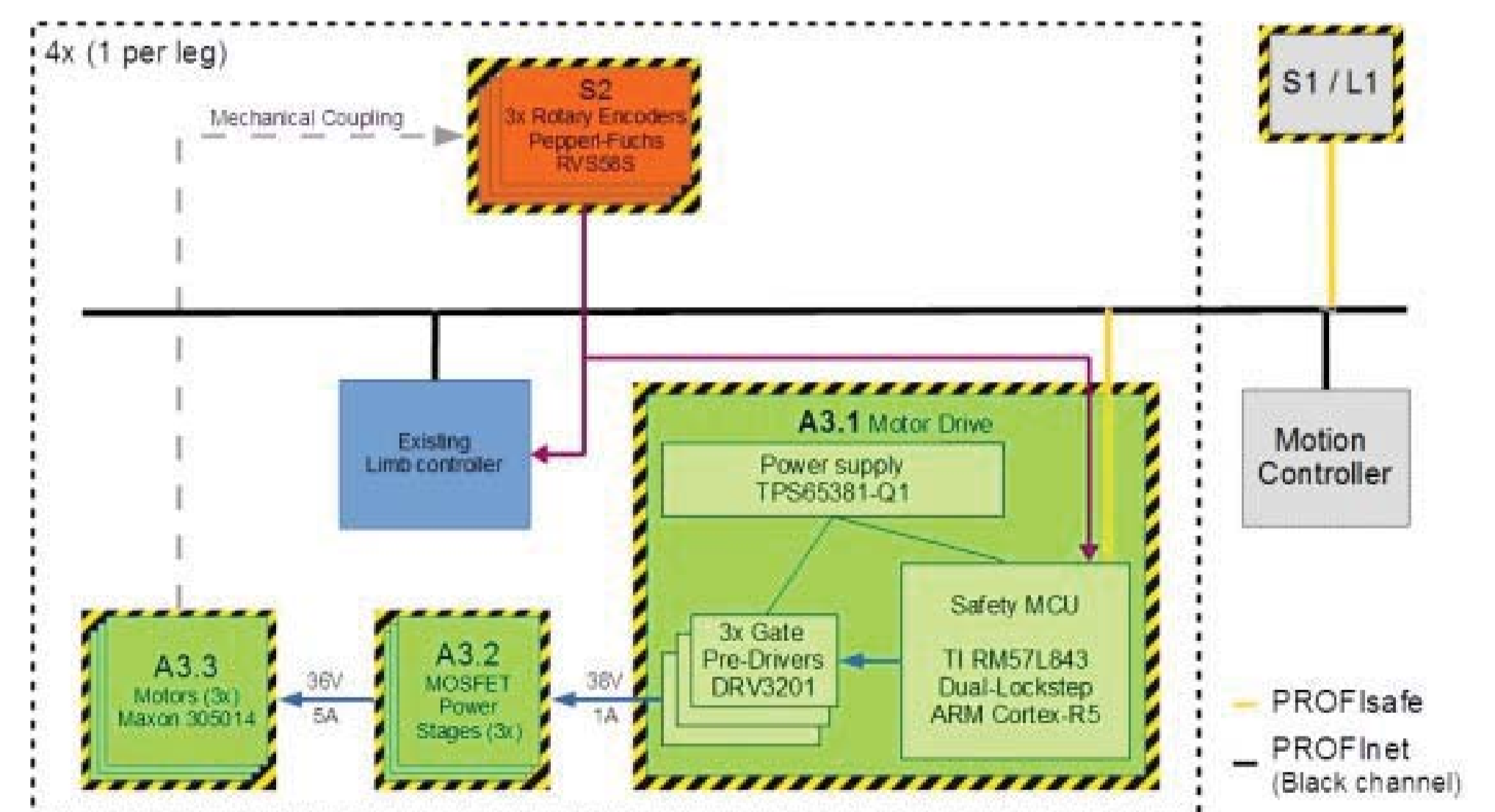
- Innovators and early adopters see benefits of technology themselves
- Early majority market must be educated

1 Marketable Use Cases

Advantage: No damage to terrain (carpet or soft agricultural land)

- Stair climbing robot as removal assistant
- Weed-Killer

5 Distributed Controller Architecture



Result: To apply safety function, legs need to be able to move autonomously

- One controller at each leg / shoulder
- Distributed controlling based on ring topology real-time Ethernet

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