

Q&A Summary - CHAMP Info Session

1. Demonstrating AI Integration

Question: How can applicants demonstrate AI integration in their solutions?

Answer: Applicants are encouraged to integrate their designs with NVIDIA's Omniverse simulation platform. Chewy is requesting Omniverse-ready simulation assets to evaluate AI integration, which includes perception, control, and decision-making capabilities. Simulations showcasing autonomous path planning, object recognition, and manipulation will be assessed.

2. Submission Format

Question: If applicants have a fully developed solution but not in Omniverse simulation, can they provide videos and documentation instead?

Answer: Yes. Applicants can submit videos and documentation showcasing physical prototypes or simulations. Performance metrics, even from non-Omniverse simulations, will be considered.

3. Proposal Requirements

Question: How detailed does the outline of the design idea and approach need to be in the application?

Answer: A detailed yet flexible approach is preferred. Applicants should outline general modules (e.g., mobility, manipulation, perception) with some level of detail but do not need to submit full technical specifications. Honesty about unknowns is acceptable, and high-level conceptual designs are welcome.

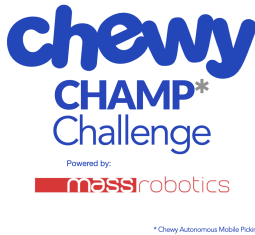
4. Solution Type

Question: Are you specifically looking for cobots, or is a modular cell setup also acceptable?

Answer: The challenge seeks mobile collaborative robots (cobots) due to their ability to integrate into existing human-designed workflows without requiring infrastructure changes. Modular cell setups would contradict the goal of maintaining flexible operations.

5. Picking and Placement Specifications

Question: Are all picks and placements required to be vertical, or will the robot need to handle items from the side as well?



Answer: Not rigidly defined. The solution depends on the robot's design. Both top-down and side grips are acceptable, provided the approach handles the required variability in items.

6. Product and Box Specifications

Question:

- What are the exact dimensions and weights of the items to be picked?
- What are the minimum and maximum box sizes that applicants should design for?
- Can you provide a visual example of the box the bags need to be placed into?

Answer:

- Weight: 10-60 lbs; Dimensions: 6x6x6 inches to 30x20x20 inches.
- Box sizes match the maximum item dimensions.
- Boxes are standard cardboard with rigid, vertical flaps.

7. Pallet Details

Question:

- What are the maximum and typical heights of the pallets involved in the challenge?
- Are all products on the pallet uniform, or do they vary?

Answer: Pallets typically hold uniform products, but product rotations occur as inventory depletes. Height specifics are not provided but should align with standard warehouse practices.

8. Warehouse Environment Constraints

Question:

- Are the specified lane widths for the challenge inflexible?
- Is the box placement always on a conveyor belt at the end of the aisle?

Answer:

- Lane widths are preferred as specified. Flexibility may be considered but is not ideal.
- Box placement will be standardized in a fixed position near the conveyor.
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9. Operator Involvement

Question:



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- Will operators position open boxes, or is this part of the robot's task?
- Will operators remove boxes once filled, or is the robot responsible for this step?

Answer: Operators will likely position open boxes, while removing filled boxes is expected to remain a human task. Tim highlighted that processes such as removing shrink wrap from pallets will remain manual, allowing the robot to focus solely on automating picking and packing. This division aligns with Chewy's collaborative approach, ensuring safety and simplicity in integrating robots into human-centric workflows.

10. SKU Management

Question: How many SKUs are anticipated, and are they grouped by size on the warehouse floor?

Answer: Chewy manages ~60,000 SKUs.

11. Warehouse Operations

Question:

- How is replenishment currently managed in Chewy's warehouses?
- Does a single pallet location consistently hold the same product over time, or do product locations change frequently?

Answer: Replenishment involves forklifts loading pallets onto rollers, which are pushed forward into picking zones. Pallet locations are virtual and may rotate as inventory depletes, but these changes are manageable. Tim emphasized that applicants should not focus on these operational specifics now. Instead, prioritize solving the core robotic challenge as outlined, leaving edge cases and externalities for later refinement.

12. Evaluation Criteria

Question: Can you provide details on the evaluation metrics that will be used to assess the feasibility of the solutions?

Answer: The evaluation will focus on four key metrics: safety, functionality, performance (speed, quality, and reliability), and scalability. Tim noted that while these pillars are central, the specific rubric will be developed as the challenge progresses. He emphasized Chewy's intent to avoid constraining applicants with overly detailed requirements early on, allowing for innovation and diverse approaches.

13. Financial Support



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Question:

- Will funding be provided to support the six-month development period?
- Is there a targeted ROI dollar amount and timeline estimated for this solution?

Answer: No funding will be provided during the six-month development period; the \$30,000 prize will be awarded to the winner upon completion of the challenge. Tim clarified that while financial support will not be available during the challenge, Chewy plans to negotiate a commercial agreement with the winner for further development and scaling. He emphasized that defining ROI metrics or cost constraints at this stage would limit innovative thinking, as this is a long-term, multi-year endeavor.

14. Collaboration Opportunities

Question: Will there be opportunities to team up or network with other participants during the competition or before the application deadline?

Answer: Applicants are encouraged to leverage the MassRobotics community to connect with other innovators. Concrete requests to the MassRobotics team for introductions or collaboration opportunities are welcome, and the team will do their best to facilitate connections with available parties.

15. Intellectual Property (IP)

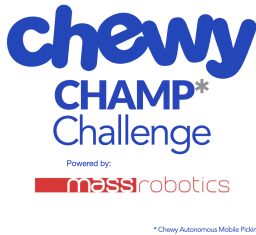
Question:

- Who will own the intellectual property (IP) for the solutions developed as part of the challenge?
- What are Chewy's expectations regarding intellectual property that arises from the co-development and testing process?

Answer: Ownership of intellectual property will depend on the nature of the solution. Existing IP brought by applicants remains theirs, while any jointly developed IP during the collaboration may be co-owned. Chewy expects most solutions to involve customization, which could result in shared IP. Applicants with ready-to-deploy solutions will retain their IP entirely. Tim emphasized the flexibility of IP agreements to suit the level of collaboration required for the final solution.

16. Deployment Plan

Question: Has the location for the first deployment (pilot) of the winning solution been determined?



Answer: The deployment location is not yet finalized but will likely involve Chewy's Boston robotics lab for initial testing.

17. Gripping Mechanism

Question:

- Is Chewy using a pneumatic or mechanical gripper for its 6-axis arm, and are all grips from the top?
- Do you intend to have a single robot capable of mix-picking products of varying sizes using the same device?

Answer: Chewy's existing 6-axis robotic arm uses a pneumatic gripper, but this challenge does not impose a specific gripping mechanism. Applicants are free to propose solutions involving top-down or side gripping, depending on their design. Tim noted that handling variability in item types is critical due to differences in packaging, such as vacuum-sealed bags or malleable materials. For mix-picking, Chewy is open to both single-robot designs capable of handling all item types and multi-robot or zoned approaches using specialized end effectors. Flexibility and adaptability are key considerations.

18. Other questions

Question:

- Has Chewy already tried to develop a solution for this problem, or is this challenge the first attempt to address it?

Answer: This is Chewy's first attempt at solving the challenge through a collaborative approach. While they have deployed automation systems in the past, these were primarily rigid work cells rather than mobile, flexible solutions. Tim emphasized that this challenge is a significant departure from previous efforts, aiming for a freeform, adaptable robotic system.

- Do you have any metrics on the units per hour and cost per hour that current staff members are achieving in these tasks?

Answer: Tim declined to provide specific metrics, stating that sharing such data could constrain innovative thinking. He reiterated that the focus should remain on designing a feasible solution rather than being overly influenced by current operational benchmarks.

- Is the intent to remove the conveyor system and replace it with autonomous transport?

Answer: The conveyor system will remain part of the operational workflow. The challenge focuses on enhancing picking and packing efficiency rather than replacing



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existing infrastructure. Tim clarified that integrating robotics into current systems is the priority.

- Will physical samples of the items to be handled be provided at MassRobotics for applicants to access?

Answer: Yes, physical samples of the items, such as bags, boxes, or pails, can be made available at MassRobotics for testing or observation. Applicants can coordinate with the MassRobotics team to arrange access to these samples during the challenge.

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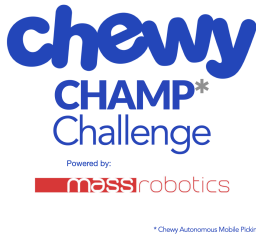
On December 5, 2024, Tim Foley, Senior Director of Robotics and Fulfillment Technology at Chewy, hosted an info session for the CHAMP Challenge, outlining the problem statement, goals, and requirements for developing a fully autonomous mobile robot to automate the picking and packing of heavy items like dog food and cat litter. The session detailed the challenge's scope, including workspace constraints, evaluation criteria, and Chewy's emphasis on innovation, collaboration, and scalability, with applications closing on December 16, 2024. Tim also addressed participants' questions about AI integration, submission formats, and the operational workflow, highlighting the use of NVIDIA Omniverse for simulation and a timeline culminating in June 2025 with the announcement of the winning solution.

The CHAMP Challenge aims to develop a fully autonomous mobile robot to address a critical need in warehouse automation. This initiative, in collaboration with MassRobotics, seeks innovative solutions to improve efficiency, safety, and scalability in handling heavy and bulky items such as dog food and cat litter.

Defining the Problem

Chewy's fulfillment centers handle millions of orders weekly, with many items weighing between 10–60 pounds and requiring careful handling to avoid workplace injuries and inefficiencies. Current automation solutions, such as rigid work cells, are nearing their limits in scalability and flexibility. The challenge is to design a mobile robot that operates in dynamic environments without requiring significant infrastructure changes.

The solution must navigate a 20x60 ft workspace with 20-inch aisles, handle single SKU pallets, and individually pick items to pack into standard cardboard boxes. Chewy emphasizes minimizing human intervention while ensuring the robot integrates seamlessly into spaces designed for human workers.



What is this Challenge Looking For

Foley outlined four core evaluation criteria for applicants:

- **Innovation:** Solutions should avoid rigid work cells and adapt flexibly to existing workflows. Chewy seeks novel approaches to automate picking and packing while maintaining operational simplicity.
- **Experimentation:** Applicants are encouraged to use Chewy's NVIDIA Omniverse assets for simulation and testing. Both digital designs and physical prototypes are welcome, enabling smaller teams to participate without needing full prototypes upfront.
- **Collaboration:** Chewy envisions a co-development journey with participants, prioritizing solutions that can evolve into scalable systems deployed across multiple fulfillment centers.
- **Scalability:** The solution must demonstrate the potential for large-scale implementation, with hundreds of robots operating efficiently across Chewy's nationwide network.

Timeline

- December 16, 2024: Applications close.
- January 2025: Selected teams announced.
- June 2025: Final testing and winner announcement.

Chewy's Boston robotics lab will serve as the initial testing site, providing a controlled environment for evaluating solutions before potential deployment in production facilities.

The CHAMP Challenge is not just a competition; it's an opportunity to collaborate on shaping the future of warehouse automation. Chewy invites participants to leverage their creativity and technical expertise to meet this ambitious goal.

For more information and resources, visit the official [CHAMP Challenge website](#).