

RoboEX Meshing Project - Clarifying Questions

1. How will mesh storage be handled? Are database integrations required?
2. What kind of boundary conditions need to be supported in the simulation?
3. How will these meshes be used in simulations? Are they for CFD (Computational Fluid Dynamics), FEA (Finite Element Analysis), or another type of numerical analysis?
4. Are there any constraints on element quality? (e.g., aspect ratio, skewness, Jacobian condition)
5. Are there industry-standard meshing benchmarks we should compare against?
6. Should we just use a pre-made mesh instead of developing one ourselves?
7. What are the expected computational constraints when running the meshing process?
8. How does meshing quality impact the accuracy of the overall simulation? What level of precision is required for meaningful results?
9. Are there specific numerical methods or solvers the mesh must accommodate?
10. Should the mesh be structured, unstructured, or hybrid?
11. Is parallel processing or GPU acceleration required for mesh generation?
12. Do we have any previous mesh examples that were deemed acceptable?
13. What is the maximum memory footprint allowed for storing the mesh?
14. Do we need to support adaptive meshing, or is a static mesh sufficient?
15. Should the meshing algorithm prioritize speed, accuracy, or memory efficiency?

16. What physical phenomena must the mesh support? Are we simulating fluid-structure interactions, pressure loads, thermal effects, or other forces?
17. What are the key failure modes of the current meshing algorithm? Are there known issues?
18. Are any proprietary or commercial meshing tools available to assist?
19. How frequently will the mesh need to be regenerated?
20. Is there a preferred meshing library we should integrate (e.g., TetGen, Gmsh)?
21. What are the input file formats for the existing meshing algorithm? (e.g., STL, OBJ, etc.)
22. What are the primary engineering goals of this project? Is it focused on structural integrity, hydrodynamic efficiency, material optimization, or something else?
23. Is meshing a real problem, or is it just a software issue?
24. How will we validate the generated mesh? What metrics define a 'good' mesh?
25. Can we make the algorithm 'just work' without too much optimization?
26. Is a spherical shape harder to mesh than a square?
27. What environmental conditions are expected in the deep-sea environment? Are there factors like extreme pressure, temperature gradients, or fluid turbulence that need to be accounted for in the mesh?
28. Will the humanoid robot have moving parts that affect mesh quality?
29. What level of detail should be preserved in the humanoid robot's mesh?
30. What is the target level of mesh resolution, and how does it vary for different components?

31. Should the mesh generation be fully automated, or is some user input expected?
32. How do meshes work in general?
33. Is there a specific way the mesh output should be visualized for debugging?
34. How does the humanoid robot's complex geometry challenge the meshing process?
35. What simulation software or solver is the mesh intended to be used with? (e.g., OpenFOAM, ANSYS, etc.)