

Rosenxt Senior Software Engineer

Common interview questions

- **What do you know about the company?**

Rosenxt group as a whole focuses on providing advanced solutions based on the latest technologies to be deployed in challenging environments. They span from hardware to software development and specialize in sensors design and physics of materials.

Some of the examples of applications are:

- Water line integrity
- Offshore Engineering Structures
- Subsea Structures
- Process optimisation
- Smart manufacturing with MES software
- Audit and Certifications with blockchain based data management
- Industrial diagnostic systems
- Advanced offshore components
- Maritime Robotics Systems
- Non-intrusive flowmeter
- Advanced materials

The items of this list can overlap and, regarding the underwater based solutions the keywords are monitoring and inspection for risk assessment and fault detection.

The company acquired Beam (ex Vaerst/Rovco) and maintains its presence in Bristol continuing on what was being developed in Beam.

Subsea Structures (Bristol division): Monitoring and maintenance solution. AUV equipped with stereo cameras, radars, imu, GPS, and USBL are used to perform the data collection. Digital Twin or Customer friendly 3D rendering of the area is produced. Automated segmentation of the data allows for aided inspection from the customer via annotated and texturized point clouds.

- **Who are you?**

I come from Rome, that is where I completed my studies: I have a master in AI and Robotics. My master's thesis was about re-implementing Loam (a widespread LiDAR SLAM algorithm) in C++. Then I worked for a year and a half in France, in Nancy, as software engineer for the national research institute. My task was to develop the entire software stack for the teleoperation and automation of an industrial robot (forklift on rails placed on roofs) used in asbestos removal. That role taught me a lot in terms of technologies and independence. After that I started working in Bristol for Kudan, maintaining a C++ LiDAR SLAM library. During this time I learned how to collaborate in a team and how to take ownership of features and coordinate other team members. I like to challenge myself by learning new concepts that I encounter during my career. My education favoured the theoretical side over the practical, which helped my capability of understanding the problem deeply and formulating solutions grounded on theoretical soundness.

- **What motivates you? / Why do you want to work for us?**

I thoroughly enjoy creating systems via software development, I look forward to each step of the process:

- The design phase: architectural considerations, understanding the requirements, roadmap creation
- The development: use a programming language as a way to express ideas into behaviours.
- The deployment: architect the most frictionless stack, automate where possible and avoid complications
- The maintenance: Adapt the initial design to take into account of new requirements, refactor and combat tech debt
- The celebration: Feel the satisfaction of knowing I have contributed to the team's effort that culminated in a successful product.

I have always been interested in SLAM: I find it an extremely interesting problem that provides the perfect professional environment where I can challenge myself. That makes Rosenxt, and specifically the Bristol division that specialises on underwater autonomous navigation, an exciting project to join. Specifically, I am curious to approach the problem from a different angle. Being the environment underwater, different rules apply and sensors behave differently due to being in water rather than in air.

The environmental implications behind Rosenxt mission resonate with me. I like the idea that my work can contribute to prevent environmental catastrophes (via monitoring and fault detection).

- **What makes you stand out? / Why do you think you are a good fit for our company?**

My expertise in LiDAR SLAM gained by maintaining and improving/expanding a C++ SLAM library in Kudan would demonstrate useful in the endeavour of developing a system for extending AUV (autonomous underwater vehicle) perception capabilities.

The knowledge acquired implementing a Sensor Fusion solution based on Gaussian Processes would also be valuable in that context. And, in general, my capability of implementing a system from a white paper will help incorporating the latest academic advancements into a commercial product. My last implementation is an Error State Kalman Filter that uses differential geometry (manifolds, sphere-2) to process IMU data.

I consider myself a team-player, proactive in communication of different points of view, capable of providing examples to convey abstract concepts, comfortable writing clear and concise documents that describe my designs and proposed ideas. Those characteristics are valuable for the team.

I like to learn and to develop my expertise following the good examples provided by other team members, I don't shy from asking clarifications and I am happy to answer as best as I can when asked questions. I value the human relationships that develop in the office, I believe that being part of a kind and wholesome group of people enhances the team productivity.