

TEAM DESCRIPTION PAPER

Team **Tux_3** competes in the RoboCupJunior Soccer Entry League and represents a continuous development journey shaped by teamwork, persistence, and competitive ambition. Over the past seasons, our team has evolved not only in technical capability, but also in structure, collaboration, and long-term strategic thinking. What began as two independent teams has grown into a unified group with shared goals and a clear vision for continuous improvement.

Our story began in the 2025 season, when two separate teams entered the competition. Henning and Alexander competed under the name Tux_3, while Max and Toni formed Tux_4. Although we worked independently at that time, we were connected by a shared enthusiasm for robotics, programming, and mechanical problem-solving. Both teams built LEGO-based robots and focused on understanding the fundamentals of autonomous behavior, match strategy, and competition structure.

The 2025 Berlin regional qualification tournament was our first major benchmark. Tux_3 achieved second place, while Tux_4 secured fourth place. These strong results allowed both teams to qualify for the German Championship in Nuremberg. Qualifying for the national level was a significant achievement and a defining moment for all of us. It validated our effort and preparation, while also exposing us to a much higher level of competition.

Competing at the German Championship in 2025 provided invaluable experience. The event required not only strong gameplay performance but also the ability to pass technical inspections, participate in structured interviews, and explain design decisions clearly and confidently. Tux_3 finished in 8th place and was only one match away from qualifying for the European Championship. Tux_4 finished in 13th place. Although we were proud of reaching this level, the competition revealed clear areas for improvement — particularly in system robustness, strategic consistency, and mechanical precision.

Rather than viewing these results as limitations, we treated them as motivation. After careful reflection, discussions, and analysis of our performance, we decided that the next logical step was to combine our strengths. For the 2026 season, we made the strategic decision to merge both teams into a single, unified team under the name Tux_3. This decision was not only about improving competitive results, but also about pooling our experience, distributing responsibilities more effectively, and learning from one another.

The transition into a unified team marked a turning point in our development. Instead of continuing with LEGO-based construction, we decided to redesign our entire robot from scratch using fully custom 3D-printed components created in Autodesk Fusion. This shift significantly increased the technical complexity of our project. It required us to deepen our

understanding of mechanical design, tolerances, structural stability, and component integration. Every design decision now required careful planning, testing, and iteration.

Moving from modular LEGO systems to a custom-built platform forced us to adopt a more engineering-oriented mindset. We implemented structured planning sessions, defined responsibilities within the team, and created testing cycles for mechanical adjustments and performance optimization. Design iterations became more deliberate and data-driven. Failures were analyzed systematically, and improvements were documented for future reference.

This development process also strengthened our teamwork. Effective communication became essential, especially when coordinating design changes and match strategies. We learned to evaluate ideas critically while respecting different perspectives. Tasks were distributed based on strengths and interests, but final decisions were always made collectively. Over time, our collaboration became more efficient and goal-oriented.

Our efforts were reflected in our performance at the 2026 Berlin qualification tournament, where we achieved second place as a newly merged team. This result was especially meaningful because it demonstrated that our structural and strategic changes had a measurable impact. It confirmed that merging our experience and adopting a custom-built approach was the right strategic decision.

However, for us, RoboCupJunior is more than a series of tournaments. We view it as a long-term educational journey. Each competition provides feedback not only about performance, but also about preparation, adaptability, and teamwork under pressure. Every match highlights both strengths and weaknesses. Instead of focusing solely on rankings, we focus on continuous improvement.

After every competition, we conduct structured reflection sessions. We analyze match recordings, identify tactical errors, and discuss communication effectiveness. We evaluate whether our preparation matched real match conditions and how we responded to unexpected situations. This reflective approach has become a core part of our team culture.

Beyond technical and competitive goals, we value fair play, respect for other teams, and constructive interaction with judges. We see RoboCupJunior as an international community that encourages collaboration and shared learning. Observing other teams, exchanging ideas, and discussing approaches has broadened our perspective and inspired further innovation.

Today, Team Tux_3 represents growth through experience, collaboration through shared ambition, and refinement through structured competition. From two independent LEGO-based teams to a unified team developing a fully custom robot platform, our journey reflects persistence, adaptability, and a commitment to progress.

We are determined to continue pushing our limits, refining our teamwork, and deepening our understanding of robotics and engineering. With every season, our objective remains the

same: not only to improve our competitive performance, but to grow as a team capable of facing increasingly complex challenges within the RoboCupJunior community.



Team Tux_3 (from left to right: Alexander Belov, Toni Schürmann, Max Harting, Henning Baumgartner)