NAME: Motion Simulation of an SSL Robot for RoboCup

TICT

DATE: October 8, 2025 11:31 PM

DESCRIPTION OF TECHNOLOGY
In the SSL, robots are compact platforms that rely on an overhead vision system (SSL-Vision) for global localization and must demonstrate precise motion control, fast decision-making, and reliable path-following under dynamic game conditions. These requirements place high demands on low-level kinematics, control software, and hardware integration. RoboHub current prototype demonstrates the correct…

HUMAN VALUES

Ensure clear communication of the limits of the simulation, so students dont develop false confidence.

Encourage balanced use: combine simulation with physical testing to keep learning grounded in reality.

Include documentation/tutorials that empower students further, supporting both autonomy and well-being.

TRANSPARENCY

Provide more user-friendly documentation (step-by-step tutorials, annotated code).

Add clear disclaimers about simulation limitations to prevent misuse or overconfidence.

Create a structured handover process for future student teams (e.g. FAQ, troubleshooting guide).

IMPACT ON SOCIETY

Optimize simulation code to reduce energy usage.

Ensure strong documentation so future student teams can reuse the digital twin.

Combine simulation with systematic hardware validation to avoid over-reliance on virtual models.

Where possible, use sustainable materials for the physical…

STAKEHOLDERS

Improve stakeholder consultation by involving RoboHub earlier in testing feedback.

Document the digital twin clearly to support future student teams.

Share simulation results and models with the broader RoboCup community to maximize educational impact.

SUSTAINABILITY

Optimize simulation software to reduce computational load and power use.

Use modular robot designs to maximize reuse of hardware across future student projects.

Source any new components from sustainable suppliers.

Encourage repair and recycling of robot hardware to reduce…

HATEFUL AND CRIMINAL ACTORS

Require clear documentation of assumptions and limits of the simulation (avoid misuse as proof).

Apply open-source licensing with attribution requirements to prevent plagiarism.

Educate students about proper academic integrity and responsible use of the simulation results.

DATA

Emphasize robust documentation of assumptions and limitations of the data.

Store simulation datasets in an open, standardized format to ensure reusability.

Include version control for models so future teams can track changes in data handling.
…

FUTURE

Maintain open-source licensing to keep access fair and transparent.

Encourage a hybrid model that combines digital twin testing with physical validation.

Share models broadly within the RoboCup community to prevent exclusivity.
…

PRIVACY

Explicitly document that no personal data is collected (to reassure future users).

If logging user activity in the future, ensure anonymization and minimal storage.

Educate future student teams about GDPR basics to avoid unintended issues.

INCLUSIVITY

Provide thorough documentation and tutorials so that future students with different levels of knowledge can use the technology.

Ensure that open-source sharing is prioritized so others outside the team can benefit.

Continue fostering diverse, international teams to avoid narrow perspectives in development.

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HUMAN VALUES

Now that you have thought hard about the impact of your technology on human values, what improvements…

If you think about the impact of this technology on human values and needs. If you think about how this technology affects the identity of the user, the autonomy of the user (can the users make their own decisions?) and the health and well-being of the user. If you think about all that, what improvement would you (want to) make? In the technology?…

TRANSPARENCY

Now that you have thought hard about the transparency of this technology, what improvements would you like t…

If you think about the communication on the way the technology works and the businessmodel. If you think about the explanation on automatic decisions that are made. If you think about complaint procedures and transparency on possible negative effects. If you think about all that, what would you (want to) improve? In the technology? In context?…

IMPACT ON SOCIETY

Now that you have thought hard about the impact of this technology on society (by filling out the questions…

If you think about the real problem this technology is going to solve. If you think about the ability of this technology to solve the real problem. If you think about possible negative effects and whether this technology will contribute to a world you want to live in. If you think about all that, what improvements would you make? In technology? In context? In use?…

STAKEHOLDERS

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them…

If you think about all stakeholders of this technology. If you think about stakeholders that are less obvious. If you think about the way certain stakeholders are affected by this technology and if you want to take them into consideration. If you think about all that, what would you (want to) improve? In the technology? In context? In use?…

SUSTAINABILITY

Now that you have thought hard about the sustainability of this technology, what improvements would you like t…

If you think about the direct and indirect energy use and the materials that are used in the technology. If you think about the lifespan of the technology and the hidden environmental impact of the technology. If you think about all that, what improvements would you (want to) make? In the technology? In context? In use?…

HATEFUL AND CRIMINAL ACTORS

Now that you have thought hard about how bad actors can impact this technology, what improvements would…

If you think about this technology being used to break the law, or avoid the consequences of breaking the law, or to be used against certain groups, or to attack the truth or to pit certain groups against each other. If you think about all of that, what improvements would you (want to) make? In the technology? In context? In use?…

DATA

Now that you have thought hard about the impact of data on this technology, what improvements would you…

If you think about the limitations of data. Things like subjectivity, incomplete datasets and so on. If you think about the way new insights are handled. If you think about the sustainability of the collection of data or the data that is collected from the users. If you think about all that, what would you (want to) improve? In the technology? In context?…

FUTURE

Impact Improvement: Now that you have thought hard about the future impact of the technology, what…

If you think about an utopian and a dystopian scenario. If you think about the way this technology can change the world. If you think about the consequences of a different party buying your technology. If you think about all that, what would you (want to) improve? In the technology? In context? In use?…

PRIVACY

Now that you have thought hard about privacy and data protection, what improvements would you like to make?…

If you think about this technology invading someone's privacy or collecting personal data and if you think about the way this technology is compliant with prevailing law and mitigates dataprotection risks and concerns. If you think about all that, what improvements would you (want to) make? In the technology? In context? In use?…

INCLUSIVITY

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to…

If you think about accessibility to this technology. If you think about built in biases or automatic decisions that may be biased. If you think about who is benefitting from this technology and the diversity of the team that creates the technology. If you think about all that, what improvements would you (want to) make? In the technology? In context? In use?

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