Thesis projects at Algoryx Simulation 2023

Title	You are	You will be doing	This is important for	Your work could lead to
Wave models	a student of Engineering Physics or similar with an interest in programming and physics simulations. You might have taken a course in computer graphics.	development and testing of a model of sea waves that represents surfaces and velocity fields used in hydrodynamic simulations.	getting correct behavior of ships, underwater vehicles and other objects in water. Waves have a great impact on the hydrodynamic effects that are acting on an object which makes wave generation a key part of hydrodynamic simulations.	a future position at Algoryx which takes the result to market, or a publication that generates impact in the field of offshore simulations.
Rendering of deformable terrain in Unreal Engine	a student of Computer Science or Engineering Physics. You have a keen interest in rendering/3D Graphics. You like to solve problems. Perhaps you have some experience in using game engines?	development/research of state-of-the-art rendering of deformable/soil materials. Screening for existing methods, applying your experience to an Unreal Engine implementation.	bridging the gap between digital models and reality. Rendering is not only used for human consumption, but also for generation of sensor data (lidar, cameras, etc.). Also, a good-looking model makes a good physical model even better!	a job at Algoryx Simulation, working on state-of-the-art simulations with high visual quality. Also, academic publications are a good way to position yourself and the company on the world market.
Physics Authoring In The Cloud	Interested in learning and researching new technologies and concepts. You should be interested in web technologies and possibly gaming physics. You might be a student of Computer Science or Engineering Physics for example.	advanced web development work, creating a 3D physics editor in the cloud using a Domain Specific Language (DSL) C++ library. This probably means compiling the C++ library to Web Assembly and interfacing with it from a Javascript web framework like React or Vue using 3D and physics libraries.	Lowering the threshold for describing physics using a Domain Specific Language. Enabling non-coding simulation experts to model physics and robotics using a graphical UI.	A future career in e.g robotics, graphics, gaming, a future position at Algoryx which takes the result to the market.
Simulation Validation Framework	a student of Engineering Physics, or equivalent. You love solving problems, have been studying numerical methods, Maybe you have taken a few extra programming courses.	development of a framework for parameterization and validation of simulation models. The goal is to make simulated robots and real-life robots move identically, by parameterizing simulation models based on training data from the real-life robots.	closing the reality gap. The results we do in simulated experiments generate what we call synthetic data. If the simulation models used move and interact with the surroundings identical to the real world, we get high quality synthetic data!	a standardized method for validating simulation models that can close the reality gap. This would be a great tool for solving general automation problems and enabling robots to do more general things.
Domain Specific Modeling	A student of the Masters programme on Robotics and Control or maybe a student of UX Design with programming skills.	Development and evaluation of robotics software, simulation models and tools for robot simulation. Interviews and research for designing a future proof domain specific language for modeling of robots.	Lowering the threshold for advanced robot simulations. Enabling non simulation experts to access advanced simulation features.	A new standard for robotics! The current standards are far from complete. A widely used format is URDF, which is not capable of covering everything needed for a full robot or environment description.
Real Time deformable terrain-vehicle interaction	a student of Engineering Physics. You have a love for modeling and simulation, making use of your skills in programming and problem solving. Perhaps you have some experience with 3D graphics?	development/research of models and numerical algorithms for real time physics simulation of vehicle-terrain interaction, with focus on soil deformations and forces from tyres and tracks.	simulation-based developing new type of construction equipment and control with good mobility on different types of soils. Customer use-cases range from future Moon missions, autonomous mining vehicles, and remote control of sub-sea machines.	a job at Algoryx Simulation, working on state-of-the-art physics simulations with high transfer from virtual to real. Also, publications are a good way to position yourself and the company on the world market.
Constraint driven conveyor belt	a student of Engineering Physics. You love solving problems and have been studying numerical methods. Maybe you have taken some extra programming courses?	development/research of models and numerical algorithms for modelling a conveyor belt that can be applied to the constraint model of AGX Dynamics. You will implement a prototype to test and validate the models.	virtual commissioning and digital twins of factories.	job at AI+B3:E8goryx Simulation working on developing simulation models to simulate realistic physical behaviours for the industry around the world.

Contact   contact@algoryx.com