

## Available Projects/Research Topics at TU Graz for Spring/Summer 2021

Duration and start date are flexible

no financial compensation available

NR	Institute	Supervisor Name	Project Title	Project Description	Academic requirements (if any)
01	Institute of Interactive Systems and Data Science	Jana Lasser	Agent based simulations for the investigation of strategies to prevent the spread of COVID-19 in schools	We have created an agent-based simulation framework to investigate the spread of COVID-19 in small communities, such as nursing homes or schools. This framework is currently being used to inform policy decisions regarding COVID-19 in Austria. The framework is written in Python and fully openly accessible (see <a href="https://github.com/JanaLasser/agent_based_COVID_SEIRX/tree/master">https://github.com/JanaLasser/agent_based_COVID_SEIRX/tree/master</a> ). In these simulations, infections can be passed between agents interacting with each other through a defined and time-resolved contact network. In addition, there can be intervention measures, such as diagnostic testing of symptomatic cases, preventive screening, tracing, isolation, ventilation, and mask-wearing. We are currently specifically interested in modelling and comparing different prevention strategies in schools, with a focus on testing frequency and testing technologies. A question that is currently unexplored is the timing of the preventive screens: Daily life in schools has a distinct rhythm (5 days of lessons, 2 days off) and the precise timing of the preventive screens in relation to this rhythm might have an impact on the efficiency of this prevention measure. This is what we would like to explore in this project.	<ul style="list-style-type: none"> <li>* Basic knowledge of statistics.</li> <li>* Good spoken and written English.</li> <li>* Experience using Linux and command line systems.</li> <li>* The simulation code is available and only needs small modifications to investigate the research question of this project. Nevertheless, experience with programming in Python is strongly advised.</li> <li>* Experience using shell scripts and running simulations on several cores in parallel will be helpful but can be learned on-the-job.</li> <li>* A Bachelor degree is not required for this project.</li> </ul>
02	Institute of Software Technology	Gerald Schweiger	Intelligent Energy Systems	We are developing an IoT platform and different energy services for our campus. It is a cloud-based framework that captures operational data and hosts data analytics services (mostly machine learning algorithms, i.e. neural networks and other statistical methods, but also hybrid simulation approaches).	You should know what classes and objects are. You will have to use git, so it helps if you have experience with VCS. It is helpful if you know what docker is, and if you don't you should be fine with having to learn about it. You should have experience in Machine Learning and Python.

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04	Institute of Interactive Systems and Data Science	Johanna Pirker	Maroon	<p>Maroon is an interactive virtual laboratory and experiment environment that allows students to explore various experiments and phenomena in an immersive and engaging way. It is implemented in Unity and supports different platforms with different levels of immersion such as virtual reality, mobile devices, or web-based platforms. The learning activities and experiments are designed for active learning to involve students in the learning process.</p> <p>We are looking for students who are interested in extending the framework "Maroon", enhance the virtual reality experiences, or add new learning experiences to Maroon.</p> <p>For more details: <a href="https://maroon.tugraz.at/">https://maroon.tugraz.at/</a></p>	Qualifications: Unity, C#, Interests in STEM topics, Interest in games
5	Spontaneous application	No suitable project in this list but you are still interested in an (online) overSEAs internship/research at TU Graz? Prepare all required application documents and specify in what topics you are interested. The International Office at TU Graz will have a look if a suitable project/supervisor can be found			