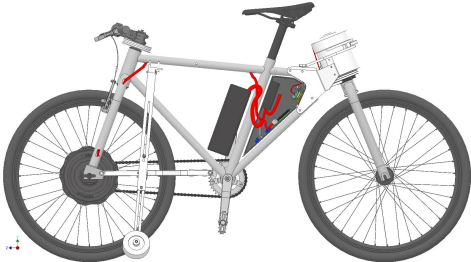


## Open Project(MA/SA)

### Implementation of a Data-Driven Model Predictive Controller for a Self-Stabilizing Bicycle

<p><b>Description:</b></p> <p>The rear-steered bicycle (RSB) is difficult for humans to stabilize around its upright position and achieve a steady ride. We have successfully designed several model-based controllers for the RSB over the last few years and we have demonstrated their effectiveness in simulations. However, in order to implement these controllers to stabilize the bike, we need a precise model of the bike, which is difficult to obtain. This thesis would involve studying literature on data-driven model predictive control, implementing it on the self-stabilizing bicycle, and analysing performance of the designed controller. Please don't hesitate to write us an email if you are interested.</p> <p><b>Prerequisites:</b></p> <ul style="list-style-type: none"> <li>• Programming experience, e.g., Python, Matlab, or <i>C++</i></li> <li>• Interest in topics related to data-driven controller design and autonomous vehicles</li> <li>• Basic knowledge of model predictive control or data-driven control will be beneficial</li> </ul> 	<p><b>Supervisor:</b></p> <p><b>Yifan Xie</b>        Room 3.236</p>
	<p><b>Area:</b></p> <p>Data-Driven Control        Model Predictive Control        Autonomous Vehicles</p>
	<p><b>Properties:</b></p> <p>Type: <b>MA/SA</b></p> <p>20% literature        40% implementation        40% experiments</p>
	<p><b>Beginning:</b></p> <p>any time</p>

More information: <https://www.ist.uni-stuttgart.de/teaching/bama/>

Aushang vom May 2, 2024