HOCHSCHULE RAVENSBURG-WEINGARTEN UNIVERSITY OF APPLIED SCIENCES

Projects at University of Applied Sciences Ravensburg-Weingarten (RWU)
open for international students in the academic year 2020/ 2021
(sorted alphabetically by the name of the professor in charge)

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
Lothar Berger Faculty of Electrical Engineering and Computer Science	Vertical Pendulum	Controller design and realization for balancing an vertical pendulum	Electrical Engineering, Mechatronics		X	Control Engineering, Basics of electronics		
Jörg Eberhardt Faculty of Technology and Management	Physical computing	Different ESP32 or Arduino-based projects available, to be discussed	Computer Science, Electrical Engineering, Mechatronics, others	X	X	Knowledge in the following topics: C or Python programming, Arduino, ESP32	X	X
Jörg Eberhardt (new) Faculty of Technology and Management	Autonomous Systems	Design of an autonomous mobile robot that follows a person (use case: smart luggage)	Computer Science, Electrical Engineering, Mechatronics, others	X	X	Knowledge of Python. Knowledge of ROS is helpful		X
Jörg Eberhardt (new) Faculty of Technology and Management	Autonomous Systems	Design of swarm concepts for autonomous mobile robots.	Computer Science, Electrical Engineering, Mechatronics, others	X	X	Knowledge of Python. Knowledge of ROS is helpful		X
Jörg Eberhardt (new)	Urban farming	Design of a micro-scale, fully autonomous glasshouse for the lab.	Computer Science, Electrical Engineering, Mechatronics, others	X	X	Good knowledge of Python and basic knowledge of IOT concepts		X
Jörg Eberhardt (new) Faculty of Technology and Management	3D Printing	Evaluation of body scanning and 3d printing technologies	Mechanical engineering, others possible	X	X		X	X
Tobias Eggendorfer	App development	Development of a mobile, multi-platform App with high	Electrical Engineering and IT /	X	X	A strong background in programming/ mobile App programming is	X	X

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
Faculty of Electrical Engineering and Computer Science		security, reliability and privacy requirements	Applied Computer Science			useful as well as experience in secure programming		
Tobias Eggendorfer Faculty of Electrical Engineering and Computer Science	Penetration testing embedded systems (several projects)		Electrical Engineering and IT / Applied Computer Science	X	X	A strong background in security is a required, Assembler knowledge is useful	X	X
Tobias Eggendorfer Faculty of Electrical Engineering and Computer Science	Programming of a Java-App	Java-App to support the maintenance of data processing processes directory according to GDPR	Electrical Engineering and IT / Applied Computer Science or other	X	X	Background in Java programming required	*Any frame*	*time possibl e*
Tobias Eggendorfer Faculty of Electrical Engineering and Computer Science	Development of a Web App	Development of a secure, GDPR-compliant web app to support international students	Electrical Engineering and IT / Applied Computer Science	X			X	
Tobias Eggendorfer, **Aykan Inan** Faculty of Electrical Engineering and Computer Science	Analysis of prime numbers	Analysis of prime numbers, several research questions	Electrical Engineering and IT / Applied Computer Science	X	X	A background in Maths and / or AI is useful	X	X
Tobias Eggendorfer, Aykan Inan Faculty of Electrical Engineering and Computer Science	Application of non-lossy-compression algorithms	Application of non-lossy-compression algorithms, several research questions	Electrical Engineering and IT/ Applied Computer Science	X	X		X	X
Stefan Elser Faculty of Electrical Engineering and Computer Science	Video Streaming Box	Compress a video signal on a Raspberry Pi and stream it via WLAN to a client, decompress on client side.	Computer Science, Electrical Engineering, others	x	x	Knowledge in C/C++ or Python	x	x

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
Stefan Elser Faculty of Electrical Engineering and Computer Science	Realtime Obstacle Detector (RC model ADAS)	RC model car: Evaluate camera and lidar signal on a Raspberry Pi and detect obstacles in a given path in real time.	Computer Science, Electrical Engineering, others	(x)	x	Good Knowledge in C/C++ or Python	x	x
Stefan Elser Faculty of Electrical Engineering and Computer Science	SLAM and Path Planner (RC model ADAS)	RC model car: Implement SLAM algorithm on a Raspberry Pi and use this information for a path planning algorithm.	Computer Science, Electrical Engineering, others	(x)	x	Good Knowledge in C/C++ or Python	x	x
Stefan Elser Faculty of Electrical Engineering and Computer Science	RC Car Steering (RC model ADAS)	RC model car: Override the received steering signal with own steering signal	Computer Science, Electrical Engineering, Mechatronics, others	(x)	x	Good Knowledge in C/C++ or Python	x	x
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Robot Behaviour	The ROS package decision-making can be used to control the behaviour of a mobile robot with Finite State Machines and Behaviour Trees. The task is to evaluate this package for our needs.	Computer Science, Electrical Engineering, Mechatronics	X	X	Strong knowledge in Linux, C++/Python, Finite State Machines, ROS	X	X
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Robot Virtual Reality	The task is to build a possibility to inspect robot visualization in virtual reality using existing technology (Oculus Rift and RVIZ).	Computer Science, Electrical Engineering, Mechatronics		X	Strong knowledge in Linux, C++/Python, ROS		X
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Human Movement Analysis with multiple Kinect Sensors	With the Microsoft Kinect Sensor human movement can be captured. Multiple Kinect sensors disturb themselves. The task is to find a possibility	Computer Science, Electrical Engineering, Mechatronics		X	Strong knowledge in Linux, C++/Python, 3D Vision,		X

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
		to capture a movement with multiple Kinect						
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Deep Learning for Object Recognition	Deep learning algorithms shall be used to train the object classification of a service robot	Computer Science, Electrical Engineering, Mechatronics		X	Strong knowledge in Linux, C++/Python, 3D Vision, Machine Learning, Neural Networks		X
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Deep Learning Grasping of Objects	Deep learning algorithms shall be used for training a robot arm to grasp arbitrary objects	Computer Science, Electrical Engineering, Mechatronics		X	Strong knowledge in Linux, C++/Python, 3D Vision, Machine Learning, Neural Networks		X
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Mechanical Efficiency of Bicycles	For an existing device that can measure the mechanical efficiency some improve-ments have to be made. First it needs better mechanics. Second it needs a better connection of the readings to the computer.	Computer Science, Mechatronics, Mechanical Engineering	x	x	Skills needed in mechanics, Computer hardware interfaces, data logging	x	
Wolfgang Ertel Faculty of Electrical Engineering and Computer Science	Artificial Intelligence (AI) and Sustainability	AI can help us towards a more sustainable life. At the same time however it can be very dangerous for the environment and the society due to rebound effects or military use of autonomous weapons.	Available for all faculties.	x	x	Skills needed in artificial intelligence and sustainability or social sciences or economics	x	
Wolfgang Georgi Faculty of Electrical Engineering and Computer Science	Virtual Ergometer	Development of new round courses by using a drone	Computer Science, Mechatronics, Electrical Engineering		X	Programming Language G (part of LabVIEW) or Unity (C#), Mechatronics, 3D Vision		X

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
Wolfgang Georgi Faculty of Electrical Engineering and Computer Science	Virtual Ergometer	Development respectively improvement of a remote control for selecting the course	Computer Science, Mechatronics, Electrical Engineering		X	Programming Language G (part of LabVIEW), Mechanical and Electrical Engineering,		
Wolfgang Georgi Faculty of Electrical Engineering and Computer Science	Aid for visually impaired people	Development of virtual reality glasses using smartphone technologies	Computer Science, Mechatronics, Electronics, Optics. Together with **Prof. Dr. Eberhardt**		X	Programming Language G (part of LabVIEW), Mechanical and Electrical Engineering, 3D Vision		
Martin Hulin Faculty of Electrical Engineering and Computer Science	Projects on E-Learning	Different projects available, to be discussed	Electrical Engineering and IT / Applied Computer Science/ Business Informatics	X	X	Depending on the project	X	X
Martin Hulin Faculty of Electrical Engineering and Computer Science	Projects on Object and Graph Databases	Different projects available, to be discussed	Electrical Engineering and IT, Applied Computer Science, Business Informatics	X	X	Depending on the project	X	X
Florian Kauf Faculty of Mechanical Engineering	Development of control strategies for heat pumps	Heat pumps with all elements (compressor, heat exchanger, throttle device etc.) are modelled. The system has to be controlled to optimize e.g. efficiency.	Mechanical Engineering, Mechatronics, Electrical Engineering	X	X	Control strategies, MATLAB/Simulink, Simulation		X
Florian Kauf Faculty of Mechanical Engineering	Optimization of a wireless user interface for controlling an air-conditioning system of a	The compressor and expansion valve of an air-conditioning system should be controlled and the measured temperatures and pressures should be	Mechanical Engineering, Electrical Engineering, Mechatronics	X	X	Mechanical engineering, Thermodynamics Electrical Engineering,		X

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
	Mercedes CO2-System	visualized in an p.h -diagram online.						
Florian Kauf Faculty of Mechanical Engineering	Modelling and simulation of heat exchangers	Heat transfer effects should be modelled and simulated e.g. with MATLAB/Simulink or CFD Software	Mechanical Engineering, Mechatronics	X	X	Thermodynamics, Simulation		X
Florian Kauf Faculty of Mechanical Engineering	Testing of components of a heat pump test bench	Doing heat transfer measurements, analysing the icing of an aluminium profile (surface of heat exchanger), doing modifi-cations at the test rig	Mechanical Engineering, Mechatronics	X	X	Thermodynamics, experimental		X
Florian Kauf Faculty of Mechanical Engineering	Optimization of quadrocopter with camera detection	An already existing quadrocopter with remote control and a camera system should be further optimized. E.g. a sensor communication for an intelligent detection of a target (e.g. a person wearing clothes with the integrated sensor could be followed) could be developed and integrated.	Mechanical Engineering, Electrical Engineering, Mechatronics	X	X	Mechanical engineering, Electrical Engineering, maybe Simulation		
Florian Kauf Faculty of Mechanical Engineering	Optimization of an automotive steering system test bench	A test bench with a steering system (incl. a Mercedes Cockpit and seat) already exists. Further steering parameters should be implemented. A haptical feed-back of steering torque and driving direction should be implemented.	Mechanical Engineering, Electrical Engineering, Mechatronics	X	X	Mechanical engineering, Electrical Engineering, maybe Simulation		X

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
André Kaufmann Faculty of Mechanical Engineering	OBD 2 Data Collection for driving cycle analysis	Development of Android Software for mobile devices for OBD2 Collection via Bluetooth module	Electrical engineering, Software design		X	Knowledge on internal combustion engines, OBD, CAN-Bus Excellent programming skills in Java, knowledge on serial protocolls		X
André Kaufmann Faculty of Mechanical Engineering	Waterproof bone conduction hearing aid	Design and manufacture of a waterproof bone conduction hearing aid	Electrical Engineering, Measurement Engineering		X	Strong background in programming and microcontrollers required. C/C++,Java, knowledge in design and manufacture of microcontroller boards, power electronics		X
André Kaufmann Faculty of Mechanical Engineering	Development of IOT demonstration experiments for lectures	Programming IOT experiments based on Node-RED	Electrical/ Mechanical Engineering	X	X	Knowledge of Javascript programming	x	X
Axel Olaf Kern Faculty of Social Work, Health, and Nursing	Defining basic packages in health care	Due to improved medical and therapeutic treatment options as well as the further aging of the population, the financial means of the health insurance funds will not be sufficient to finance the care unchanged. Restrictions on services will become unavoidable. A rational design of the scope of social health insurance benefits must be developed.	Healthcare management, health economics, social work, nursing, psychology,	X	X	Health policy, health economics, social policy	X	X
Axel Olaf Kern	Marketing for social and health care enterprises	In order to improve the quality of care and optimize business management in companies in	Social work, nursing, psychology, business	X	X	Marketing, business management, economics, social work,	X	X

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
Faculty of Social Work, Health, and Nursing		the social and health sector, it is necessary to direct the right patients to the most suitable facilities. Here the marketing of the enterprises plays an essential role, in order to moderate between the abilities of the enterprises and the needs of the clients.	management, economics, business administration, health care			nursing, healthcare management, health economics,		
Markus Pfeil (NEW) Faculty of Electrical Engineering and Computer Science	Construction of Embedded System Architecture from formal Requirements	Using the intoCPS infrastructure an architecture and simulation of an embedded system will be created	Electrical Engineering, Computer Science	X	X	Electrical Engineering, Programming	x	x
Markus Pfeil Faculty of Electrical Engineering and Computer Science	Creation of Embedded System Code from formal requirement model	Using the SysML model and co-Simulation of a system as a starting point, executable code for the system will be auto-created from the model.	Electrical Engineering, Computer Science		X	Programming, Simulation	X	x
Markus Pfeil (NEW) Faculty of Electrical Engineering and Computer Science	Powercontrol in automotive networks	In a Network of control boxes power saving is implemented by remote switching of unused boxes	Electrical Engineering, Mechatronics	X	X	Programming, Electronics	x	x
Cornelia Neff Faculty of Technology and Management	Research project high-tech start-ups/ venture capital	Trends and recent developments in the pharmaceutical and biotech industry in Germany; "overview study", students could analyse/ evaluate relevant industry studies and/ or portray a couple of pharma and biotech companies	Business admin, Intl. Business Management (BM, TM)	X	X	can be prepared in German, English, French, Spanish; can also be done in teams of two or three students	X Can be	X adapted

Professor in Charge	Topic	Short description	Project available for students			Student needs good knowledge in the following fields	Time frame: Project can be realised within	
			from the following fields of study	on Bachelor level	on Master level		2-3 months	4 - 5 months (1 sem.)
Benedikt Reick Faculty of Electrical Engineering and Computer Science	E-Mobility Projects (e.g. electrification of a historic Scooter)	Projects in several fields are possible. Check Moodle: "Projektarbeiten Elektrotechnik"/ Project work Electrical Engineering	Electrical Engineering, Mechatronics, Mechanical Engineering, others	(X)	X	Good knowledge in vehicle engineering and drivetrain technologies. Knowledge in mechatronics.	X	X
Gerd Thieleke Faculty of Mechanical Engineering	Simulation of dynamic behaviour of isolated net in energy laboratory of HRW with matlab/ simulink	Installed power generation in energy are water turbine (synchronous generator) solar power (electrical DC/AC-Converter) and wind power (asynchronous generator). Different load test rigs are available to change the load in the net. The aim is to simulate the isolated net with Matlab/ Simulink -Simpower – by changing the load. Comparison of simulated and experimental results.	Electrical, Automation, Mechanical and Environmental Engineering		X	Electrical engineering, programming language matlab/ simulink	X	X
Gerd Thieleke Faculty of Mechanical Engineering	Commissioning of new electronic board of pressure measurement scanner system	To measure a lot of pressure position in a turbomachine there will be used pressure scanner systems. A mechanical pressure system operates with a newly developed electronical board. The aim is to test the electronical board for the commissioning in a turbomachine.	Electrical, Automation, Mechanical and Environmental Engineering	X	X	Mechanical and Electrical engineering, programming language	X	X