

Semi-automatic R²Pi Navigation

Modul INF-BSc-251:

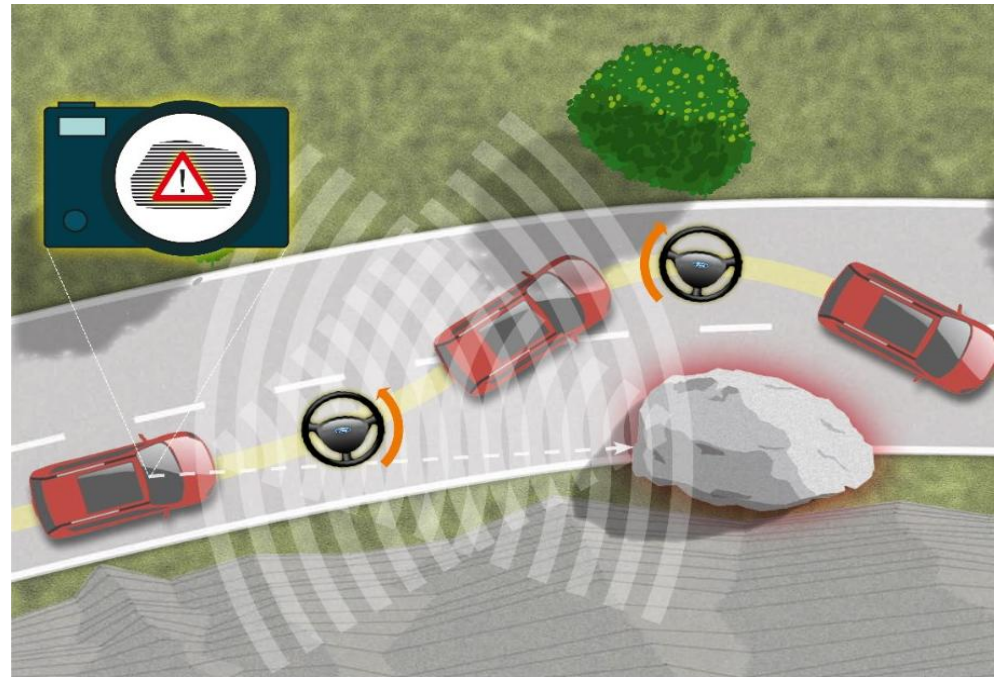
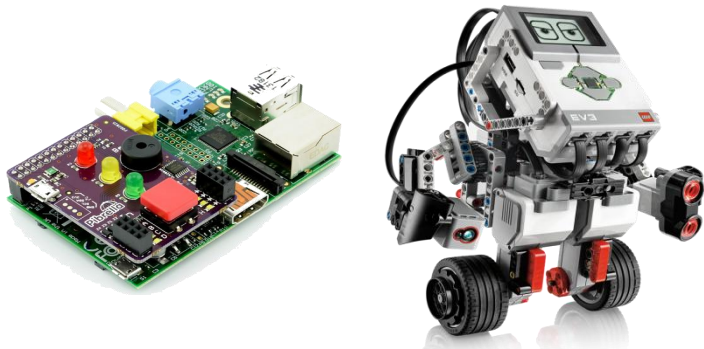
Fachprojekt „Design of Embedded Systems“-WS15

Supervisor: M. Sc. Kuan-Hsun Chen

Kuan-Hsun Chen | Dortmund 16.06.15

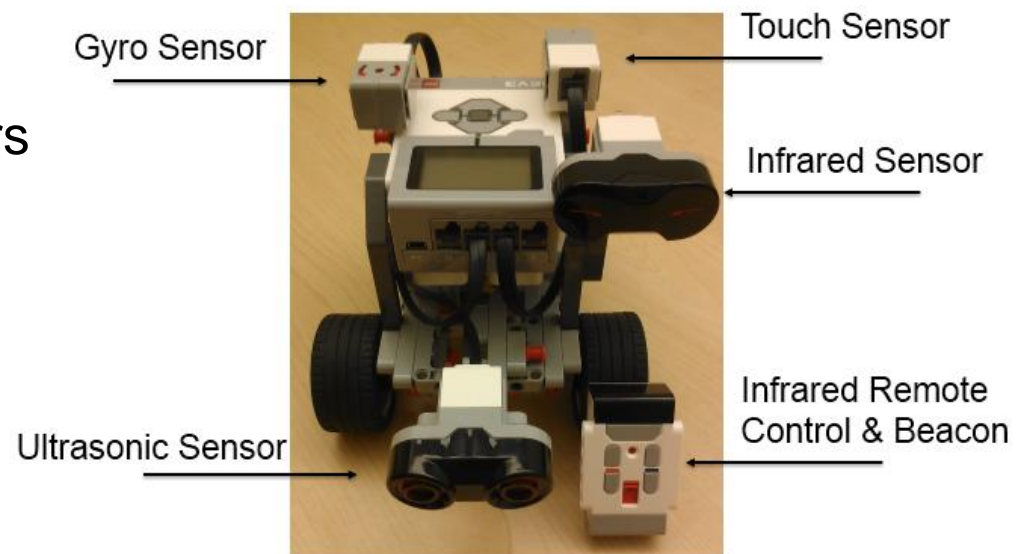
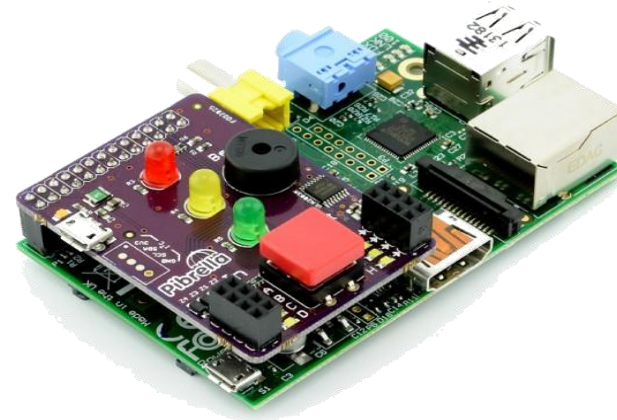
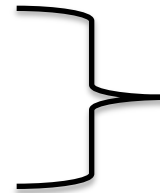
LEGO Mindstorms Robot ev3 + Raspberry Pi = Semi-automatic R²Pi Navigation

- Real-Time Traffic Situation
- Remote Control
- Energy Saving
- Information Processing



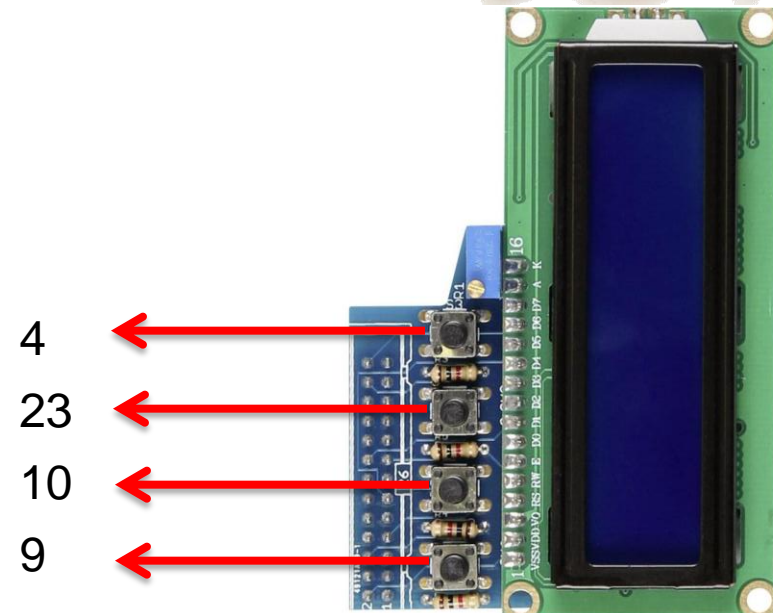
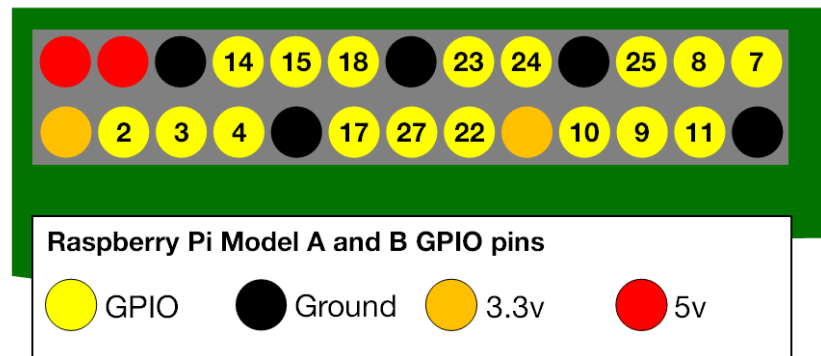
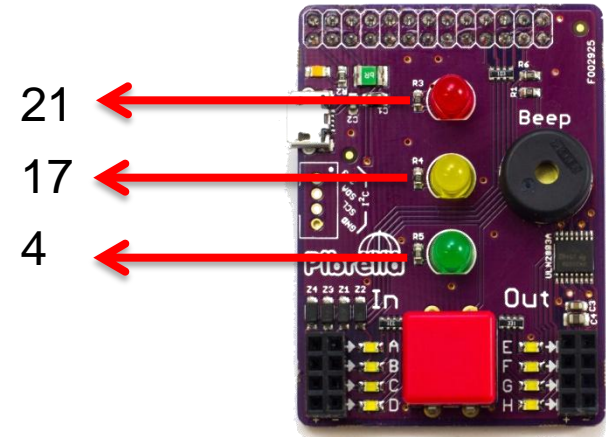
Included Hardware

- Raspberry Pi
- Pibrella (I/O device)
- Display + Keypad module (Optional)
- Bluetooth Control (Optional)
- Ev3 LEGO + WEDO Sensors
 - Open source Firmware.



[Software] Raspberry Pi

- RTEMS RTOS
- GPIO APIs
- I/O Task Scheduling
- Version control / Coding style

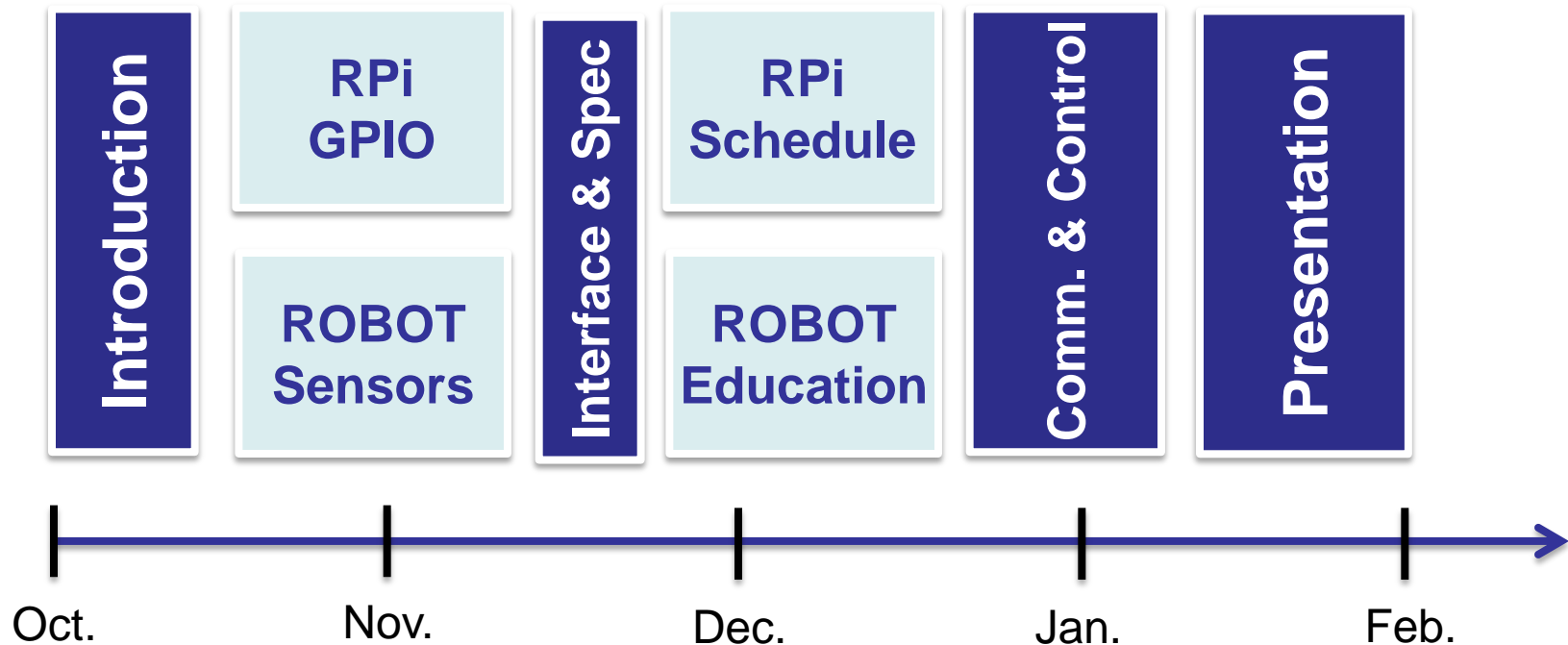


[Software] Ev3 LEGO Robot

- Ev3dev/LABVIEW
- Motor Control
- Signal Identification
- Obstacle Avoidance (Optional)



Workload Schedule (~16 weeks 19.10.15 – 12.02.16)



- RTEMS Pi Group (8 people) : GPIO, Scheduling, Lifetime Extension
- Robot Group (8 people) : LABVIEW, Data Gathering, Motor Control
- Each group has to hand in the paper report weekly.

Required Skills

- Knowledge of Java and C
- Knowledge in Linux-Liked Env.
- Some Hardware Knowledge

Acquired Skills afterward

- Low level programming in C
- Real-Time Application Programming
- LEGO Robot Programming
- Github (Open Source)/Coding Conventions
- Team Programming

Supervisor:

- M. Sc. Kuan-Hsun Chen
(kuan-hsun.chen@tu-dortmund.de)

ASCII	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
xxxx0000	(1)		0	@	P	`	P				-	9	3	o	p	
xxxx0001	(2)		!	1	A	Q	a	q			.	7	4	ä	q	
xxxx0010	(3)		"	2	B	R	b	r			「	イ	ツ	×	β	θ



xxxx1101	(5)		-	=	M											
xxxx1110	(7)		.	>	N											
xxxx1111	(8)		/	?	Q											

