

Wearable Computing Systems

eyeDrops

Lab Course 2016 / 2017

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Motivation

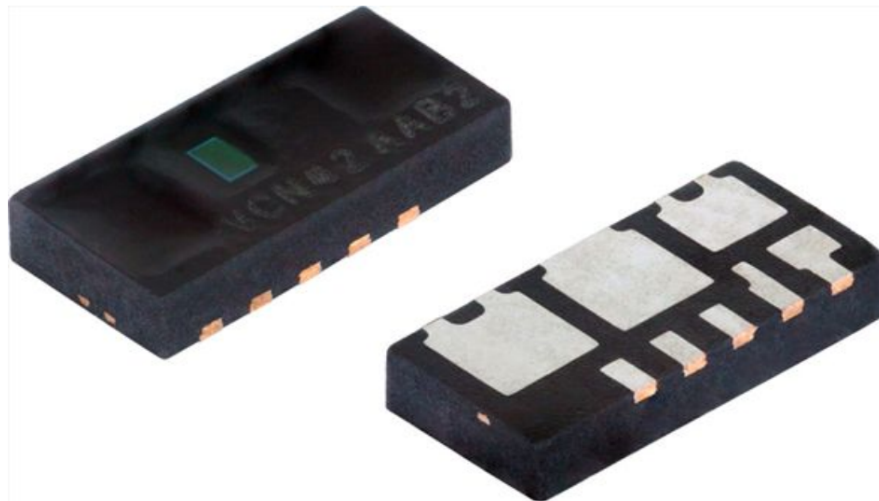
- Dry eyes due to looking at computer monitor
 - increased probability of eye infections
 - damage of the corneal surface
 - itchy eyes



<https://hylo.de/wp-content/uploads/2015/11/pc-arbeit-trockene-augen.jpg>

Idea

- Sensor that detects blinking
 - Proximity Sensor
 - Light Sensor
 - Motion Sensor



<http://www.vishay.com/docs/83476/vcnl4020.pdf>

Idea

- Sensor that detects blinking
 - Proximity Sensor
 - Light Sensor
 - Motion Sensor
- Attached to eye glasses



<https://www.blogcdn.com/www.engadget.com/media/2013/05/glasslead.jpg>

Idea

- Sensor that detects blinking
 - Proximity Sensor
 - Light Sensor
 - Motion Sensor
- Attached to eye glasses
- Blurring of monitor to trigger blinking



http://www.chip.de/ii/770454642_c0a8e0f884.jpg

Plan A - best case scenario

- Build reliable blink detection system
 - Distance or ambient light sensor
 - Proof of concept
 - Bluetooth communication
 - 3D-printed casing
 - Software for all operating systems to blurr full screen
 - Power with solar cell
- Survey to test system performance
- Develop additional applications with „blink“ as input

Plan B – alternative scenario

- Use Google Glass instead of self built blink detector
 - Software for all operating systems to blurr screen
 - Focus on software and additional applications



http://betanews.com/wp-content/uploads/2015/01/google_glass-800x450.jpg

- Communication between Google Glass and PC
- Blurr the screen
- Additional applications
- Survey to test system performance

Plan C – worst case scenario

- Use Google Glass instead of self built blink detector
 - Simplified software for one OS



http://betanews.com/wp-content/uploads/2015/01/google_glass-800x450.jpg

Other possible applications

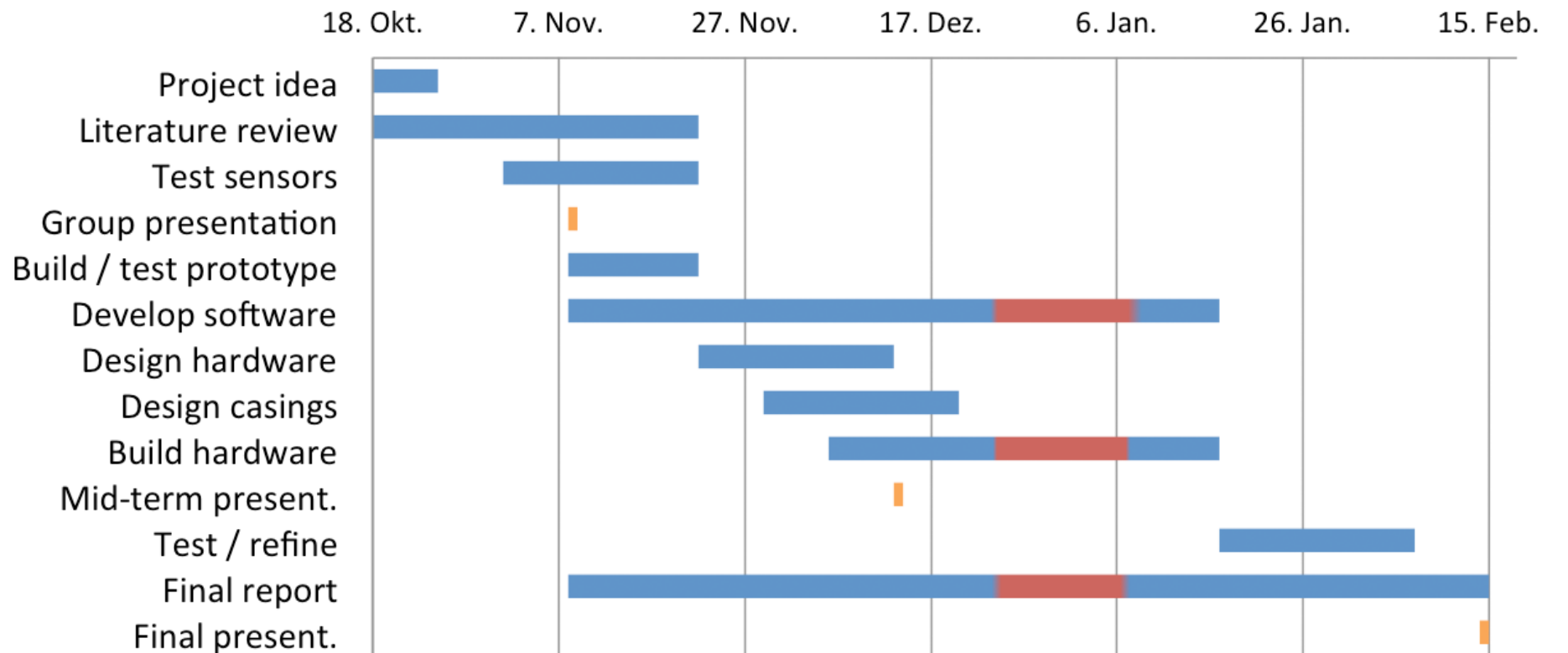
- Prevention of microsleep when driving
 - acoustic signal
- Simple games
- Input device for disabled people



<http://partner.a-z.ch/partnersite/schweiz/jeder-fuenfte-verkehrsunfall-wegen-sekundenschlaf-100812548>
Wearable Computing Systems

Project plan

Gantt chart – Wearables Lab course



	Final present.	Final report	Test / refine	Mid-term present.	Build hardware	Design casings	Design hardware	Develop software	Build / test prototype	Group presentation	Test sensors	Literature review	Project idea
Start Date	14. Feb.	8. Nov.	17. Jan.	13. Dez.	6. Dez.	29. Nov.	22. Nov.	8. Nov.	8. Nov.	8. Nov.	1. Nov.	18. Okt.	18. Okt.
Days	1	99	21	1	42	21	21	70	14	1	21	35	7

Task distribution

- Hardware design and building (Marlene, Lorenz)
- Case design (Marlene)
- Software design and development (Everybody)
 - RFDuino (Lorenz)
 - PC (Benjamin)
- Project management (Benjamin)
- Survey (Marlene, Benjamin)

Summary

- Wearable blink detection system
- Unconscious blink triggering
- Long term protection against dry eyes
- Use blink as input for various applications

Thank you for your attention!