

## Use of Augmented Reality for Visualizing Ambient Conditions while Sailing

### Student



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**Introduction:** Navigating a sailboat successfully requires a deep understanding of the surrounding environment. Common sailing instruments, which display information numerically or in 2D graphs, often require considerable experience and spatial imagination for interpretation. This thesis explores the potential of Augmented Reality (AR) in enhancing the visualization of ambient conditions, offering a more intuitive and informative approach to sailing navigation. Employing a human-centered approach, it aims to develop and validate scenarios, focusing on both usability and technological feasibility.

**Approach:** This research commenced with an extensive literature review to assess the current state of Augmented Reality applications in sailing and related domains. This was complemented by conducting five targeted interviews with a diverse group of sailors, ranging from novices to experts, to gather insights into their specific needs and preferences when sailing. This dual approach allowed for a comprehensive understanding of both the theoretical and practical aspects of Augmented Reality in sailing.

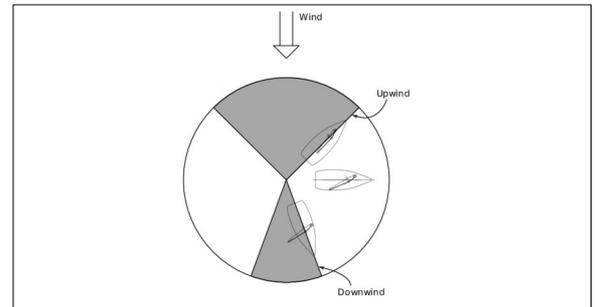
**Result:** The analysis yielded a series of detailed personas and Augmented Reality application scenarios. These personas represent a spectrum of user needs and preferences in the sailing community. For the most promising scenario, a hardware component architecture was designed, laying the groundwork for future practical implementation. Augmented Reality holds significant promise for enriching the sailing experience by offering enhanced perception and understanding of ambient conditions. However, the current state of AR technology, particularly in terms of maritime durability and waterproofing, poses a challenge. Consequently, it is

recommended to monitor ongoing technological advancements in Augmented Reality. In the meantime, exploring interim solutions or adaptations that can bridge the gap until Augmented Reality technology matures for maritime conditions would be beneficial for the sailing community.

**Common sailing instrument. Wind angle (red indicator) relative to the boat (blue outline) and wind speed in knots.**  
[www.outbackmarine.com.au/garmin-gmi-20-marine-instrument](http://www.outbackmarine.com.au/garmin-gmi-20-marine-instrument)



**Possible courses of a sailboat in relation to the wind direction. Displaying the "No Sailing Zones" in gray**  
<https://doi.org/10.1109/MRA.2010.935792>



**Elaborated AR application scenario. Visualizing wind direction (blue line) and the "No Sailing Zones" (orange area).**  
<https://www.pinterest.at/pin/467811480044097262/>



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**Subject Area**  
Software