Head-up Display for Automotive - A Landscape Study

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Wish you had more eyes?
Facts

- 6.75 million accidents occur every year only in USA
- 250,000 accidents occur due to lane change only in USA
- $120,000 average cost for large-truck accidents
- Up to $4.8 million average cost when fatalities happen
- 1.35 million fatalities occur every year globally
Head-up Display (HUD)

- Overview
Types of Head-up Display

• Combiner HUD
• Windshield HUD
• Augmented Reality HUD
Combiner HUD

- Uses semi-transparent surfaces to overlay an image
- Low cost solutions
- Basic features
WindShield HUD

Crucial information, directly displayed on windshield as a virtual image
Augmented Reality HUD

Incorporates the augmented reality technology and capable to offer Advanced Driver Assistance capabilities
Augmented Reality HUD

- The HOW

Image courtesy: Lee et al.
Current HUD Market

Market is expected to register a CAGR of 28.4%.

35.6% of market revenue was accounted for by North America in 2020.

The market was valued at USD 1.32 Billion in 2020.

$9.72B Projected Market Size in 2028

By application, the automotive segment is expected to register a steady 28.6% CAGR over the forecast period.

One of the key drivers for market growth is advancement in technology.
Market Dynamics

- Driver: Increase in awareness about passenger and vehicle safety
- Technology: Continuous advancement and new hardware boosted solutions
- Opportunity: Introduction of portable HUDs at lower prices in low and middle car segments
- Challenge: High cost of advanced head-up display systems
Regional Share

- Asia Pacific to hold the largest share
- US and Europe to follow
## Current Players

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Technical Challenges

- Building an AI Model
  - An expensive process (time, volume and variation of data and cost)
- Automated Action Such as blow horn, flash light
  - Could become annoying experience
- Technical Limitation
  - Requirement of greater space in the cockpit for the installation of HUD
Market challenges

- Incentive for Auto Manufacturers to adopt technology
- Deceleration in market due to COVID
- Competition: Too many Big and Small Players
Evolution

FOV = Field of View

Past

Present

Future AR HUDs

Narrow FOV <4°

Medium FOV 7-8°

Wide FOV >10°
The Road ahead

• Augmented Reality HUD will become a default option in the Cars.
  • OEM & Electric Cars are preferred (due to space & early opportunity)
  • Integrated eye-tracking technology to follow driver’s eyes
• Become integral part of the Self Driving cars
• Integrated into commercial vehicles to reduce the operating cost
• Split view for media entertainment in Park mode
• Integrated night vision using digital image enhancement
And...

QUESTIONS?
Thank you
Appendix
References

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