

# Automated car blinds for heat reduction

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## **Abstract**

Research and testing conducted during this project focused on developing and evaluating vehicle window shade systems specifically designed to reduce temperatures in vehicles. We conducted research into materials available in order to evaluate their suitability as window shade systems based on the level of light blockage and durability. During the course of this research project, we collected and evaluated data in order to compare the performance of different materials and to select the best performing materials for further development of the vehicle window shades. Based on our combined engineering and mechanical design knowledge, we created and designed a mechanical system that would allow for the deployment and retraction of the window shade. There are a number of controls that we investigated in order to provide customers with both a reliable and easy to operate window shade system. By going through several iterative design processes and troubleshooting problems along the way, we were able to develop an innovative solution to a significant engineering problem. The mechanism was tested on a 2010 Hyundai Elantra but can be applied to most cars with roof rails.

## **Index Terms**

automotive, solar heating, automation, car blinds, temperature reduction, deployment system, automotive design, data analysis, iterative design, shading, radiative heat transfer, Hyundai Elantra