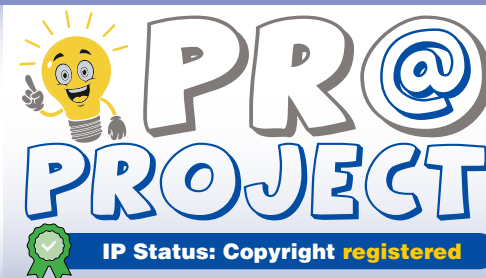


The smart cover

Complete Car Protection With Just A Push Of A Button



Stuti Kalra, GT Network

Protecting a parked vehicle from harsh weather often involves wrestling with large, bulky covers that are inconvenient to use. Recognising this everyday challenge, **Ira Agarwal**, an alumna of **AIS Vas 6** who is currently pursuing B.Tech in Computer Science and Engineering from Manipal University, has developed **Automatic Car Cover**, an innovative system that combines automation with smart engineering to protect vehicles at the touch of a button.

Smart & efficient

The Automatic Car Cover is a motorised vehicle protection system integrated into the car's bumper. With a simple press of a button on a remote control or smartphone, the cover automatically unfolds, like an umbrella, to shield the vehicle from dust, rain, harsh sunlight, bird droppings, leaves, and other hazards. Once no longer needed, it retracts neatly back into the bumper, eliminating the inconvenience of manually folding and storing traditional car covers.

Backed by science

The project brings together mechanics, electronics, automation, and material science. An electric motor converts electrical energy into mechanical motion, allowing the cover to deploy and retract smoothly



Prototype of the Automatic Car Cover

through a specially designed folding mechanism. A microcontroller processes inputs from environmental sensors that detect rain, excessive sunlight, or dust, enabling automatic operation when required. Besides water and dust, the cover material also protects against UV radiation.

Inspired by daily challenges

The idea was inspired by observing how difficult it can be for many people to use conventional car covers. Individuals with mobility issues often struggle with the physical effort involved. And the process is cumbersome for all during extreme weather. So, Ira envisioned a smart, automated solution that would make the process effortless and accessible. Work on the project began in June 2023, and the initial prototype was completed within two to three months. Ira is currently exploring partnerships with companies that can help transform the prototype into a market-ready innovation.



A word of gratitude

Ira is grateful to Chairperson ma'am for having provided an ecosystem of scientific temperament, creativity, and ability to change an idea into innovation. She also credits her principal Sunila Athley ma'am and mentor teacher for motivating and guiding her in identifying the problem, refining the idea, and improving the design.

Future vision

Ira envisions future versions to incorporate AI-enabled weather prediction, solar-powered operation, anti-theft features, and compatibility with different types of vehicles, including not only SUVs, but two-wheelers as well. The long-term goal is to develop an affordable, user-friendly, and sustainable product that makes vehicle protection effortless for everyone.

Addressing UN SDGs

- SDG 3 - Good Health & Well-being:** Reduces exposure to heat, dust, pollutants.
- SDG 6 - Clean Water and Sanitation:** Minimises the need for frequent car washing.
- SDG 9 - Industry, Innovation and Infrastructure:** Promotes automation & smart engineering to solve everyday problem.
- SDG 10 - Reduced Inequalities:** Makes vehicle protection easier for elderly and differently abled individuals.
- SDG 11 - Sustainable Cities and Communities:** Encourages smarter urban living.
- SDG 12 - Responsible Consumption and Production:** Extends vehicle life by reducing weather-related wear and tear.
- SDG 13 - Climate Action:** Protects vehicles against increasingly extreme weather conditions.

Awards and Recognition

Year	Awards
2024	INSPIRE MANAK award by the Department of Science and Technology - first level (received a certificate and a ₹10,000 grant)
July 2025	INSPIRE MANAK award - district level (awarded a certificate and medal)
October 2025	INSPIRE MANAK award - state level, Lucknow (qualified for national level)

A sting operation



What's The Buzz Behind The Beehive?

Aarav Singh, AIS VKC Lko, VII A

A honeycomb may look like a simple wall of tiny hexagons, but it is actually a brilliant piece of natural engineering. A single colony can have around 50,000–60,000 honeybees, and together, they build these strong, space-saving structures using beeswax. So, let's buzz into the science behind this sweet wonder!

Power of six

The hexagons built by worker-bees make the comb strong through shared walls, with intersections that leave no gaps, thus creating a stable network which distributes weight across separate points instead of concentrating all force at one. So yes, a circular honeycomb would not work.

Bee maths

A dilemma began in 36 BCE, when Roman scholar Marcus Terentius Varro gave two reasons for honeycombs being hexagonal. The first stated that bees had six legs; hence the combs had six sides. And the second said that hexagons enclosed the maximum amount of space in one perimeter. This became known as the 'Honeycomb Conjecture'. Finally, in 1999, mathematician Thomas Hales proved the conjecture to be true, with his reasoning stating that if cell walls curved or bulged, the regular hexagonal tiling would still have the shortest total perimeter for any area.

Bee-ing a sculptor

Bees begin with round and cylindrical wax cells at first. When worker-bees are done chewing the scales

till they reach the right consistency of beeswax, they congregate in the hive and raise the temperature to a certain point, which weakens the intermolecular bonds of the wax, making it flexible. As the wax cools, surface tension reshapes the combs into hexagons at a 120° angle.

Sweet survival

The hexagonal structure is a lifesaver for the bees, as it requires minimal usage of energy and resources. It has helped many hives survive harsh climate and weather. Low wax usage is a boon because bees need eight ounces of honey (for which bees must visit about a million flowers) just to create one ounce of wax. Hence, bees turn mathematics into survival, proving that architects don't always carry protractors, some also wield wings.