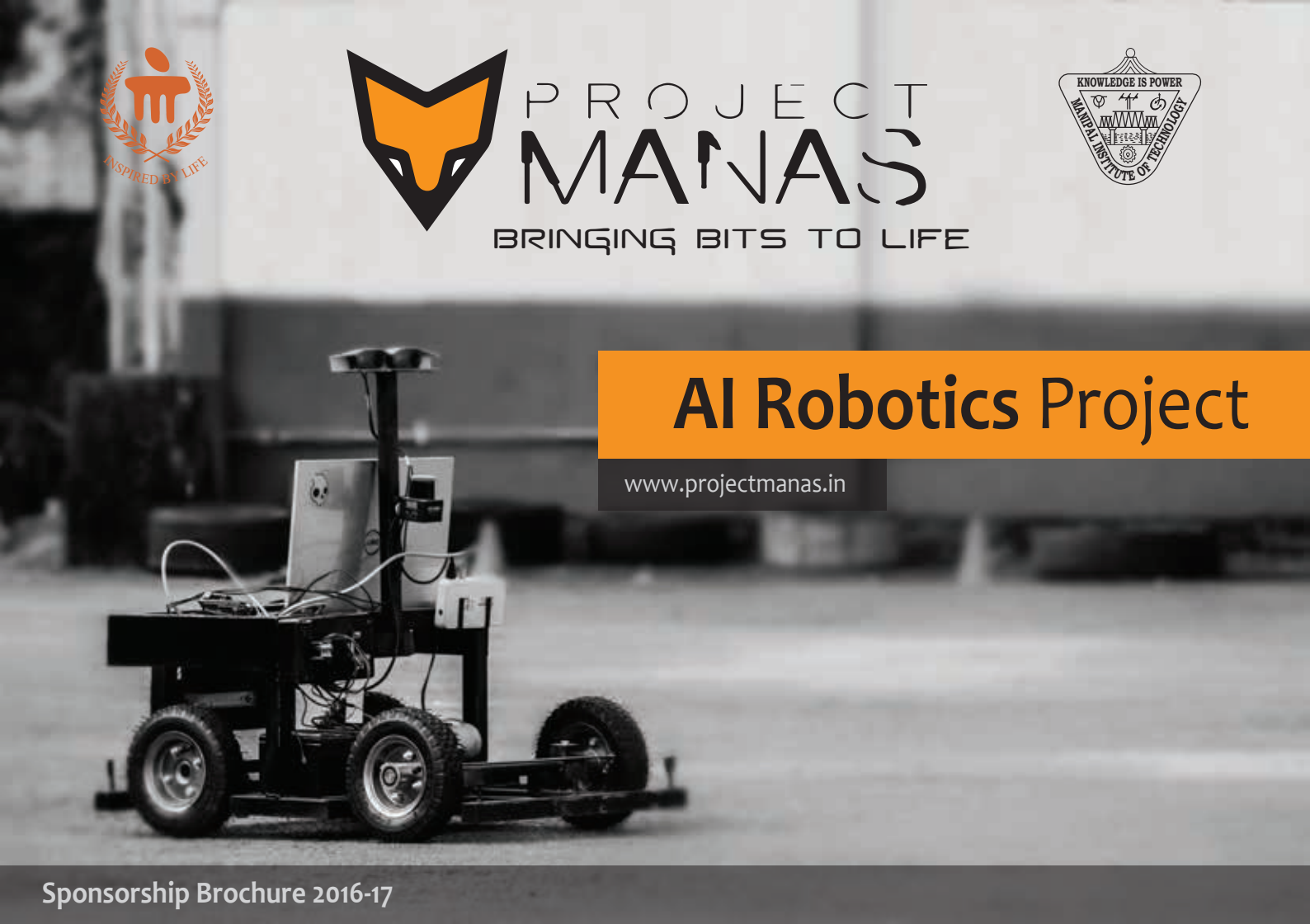
PROJECT MANAS

BRINGING BITS TO LIFE

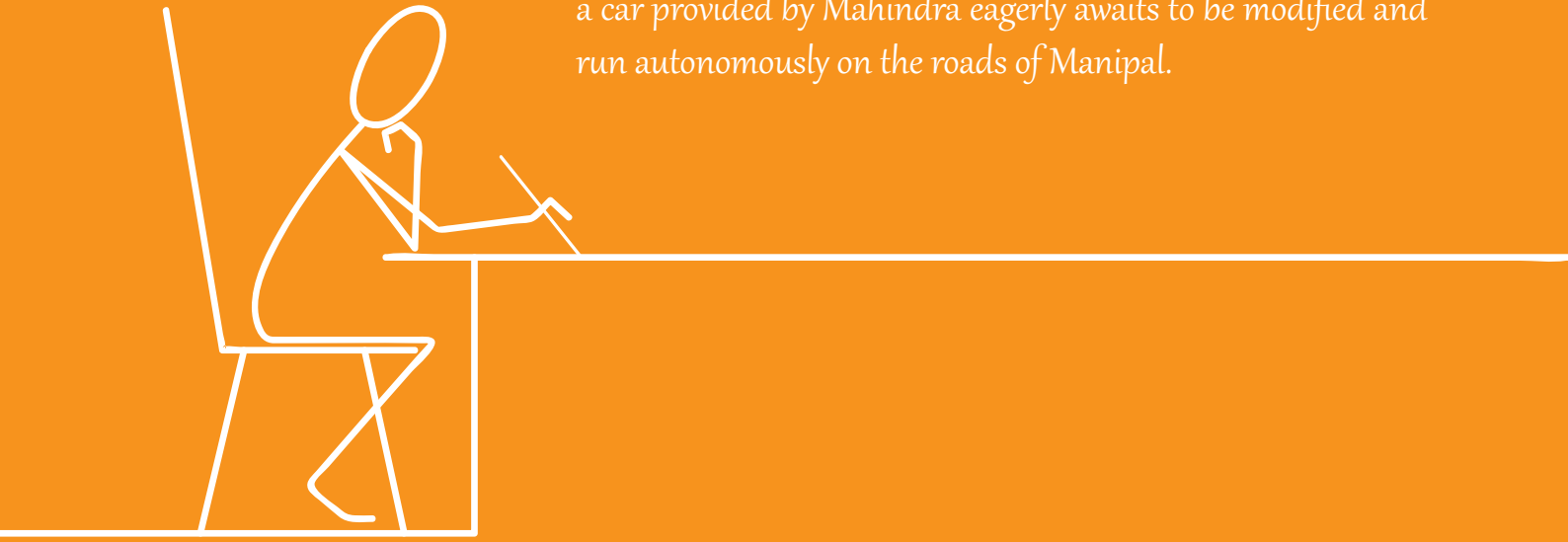


AI Robotics Project

www.projectmanas.in

Sponsorship Brochure 2016-17

With ambitious goals and a fiery team ready, Project MANAS inches towards completing its second year this fall. During this period, the team has been working on a self-driving car suitable for Indian roads. A functional prototype 'Wall-E' was born of various algorithms, circuits and mechanistic calculations. Now a car provided by Mahindra eagerly awaits to be modified and run autonomously on the roads of Manipal.



Contents

>> echo **“Hello World”**

Project MANAS was founded in the year 2014, named after the Sanskrit word “MANAS”, meaning “Higher Intelligence”, as the official undergraduate AI Robotics Team of MIT, Manipal. Project MANAS is currently a team of 45 undergraduates taking part in Mahindra’s 1 Million dollar “Spark The Rise Driverless Car Challenge”. Using the initial prototype, Project MANAS qualified the initial 3 stages and is among the top 13 out of the 259 teams across the nation.

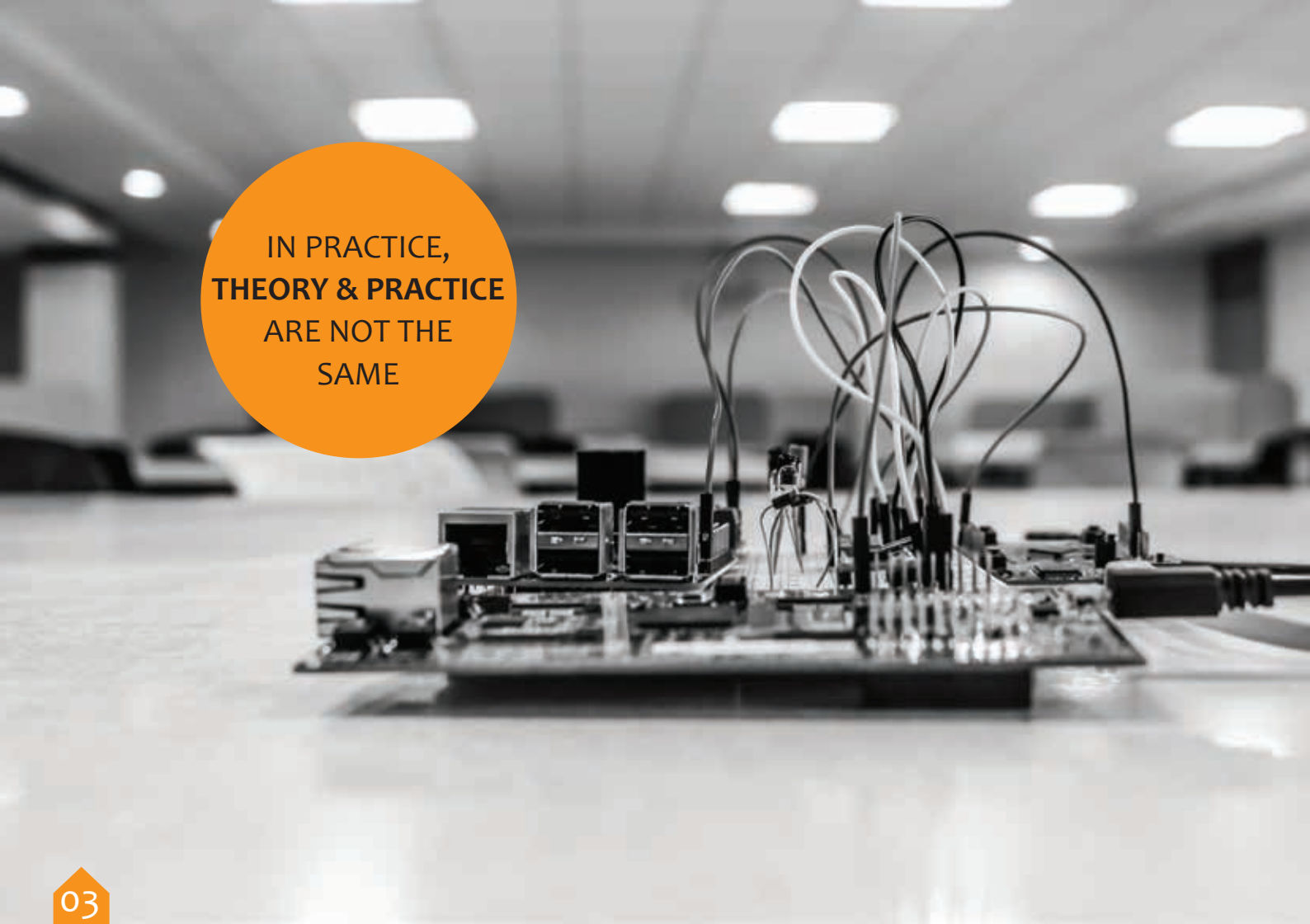
Vision: Advancement of humanity through the adoption of machines of higher intelligence, for a safer and more productive future.

> “It was inspiring to start with a blank sheet of paper and ask, What should be different about this kind of vehicle? We started with the most important thing Safety.”

Mission: Excellence in the field of AI Robotics and the establishment of a state-of-the-art research centre in India.

The research & development of fully autonomous vehicles specifically adapted to Indian market and traffic conditions.


FOR THOSE WHO
DARE TO DISTURB
THE UNIVERSE


IN PRACTICE,
THEORY & PRACTICE
ARE NOT THE
SAME

> You're either the one that creates the automation or you're getting automated.
>
> - Tom Preston Werner
> Founder of GitHub

SENSING & AUTOMATION

Sensing & Automation Division acts as a bridge between the virtual and the physical world. Using various sensors and actuators it allows the abstract algorithms of AI Division to come to life in the physical world.

SENSING

Sensing Subdivision deals with acquisition, calibration and manipulation of data from a plethora of sensors. The data is acquired in real-time with the help of microcontroller units (MCU). This unit also works on Signal Processing and Multisensor Data Fusion for localization and odometry, apart from PCB designing (through-hole and SMD) and power electronics.

AUTOMATION

Automation Subdivision deals with various actuators, embedded systems, interfacing, communication systems and intelligent controllers. This unit works with various microcontroller architectures like AVR and ARM along with RTOS. Intelligent controllers have been designed for the simulation and implementation of Neuro-fuzzy algorithms on these microcontroller platforms.

ARTIFICIAL INTELLIGENCE

Artificial Intelligence Division builds the mind of the entire system and is tightly intertwined with the S&A Division. In the AI division, the environment is perceived and decisions are then made.

> A year spent in Artificial Intelligence is enough to make one believe in God.
>
> - Alan Perlis
> Recipient of first Turing Award

PERCEPTION

The Perception layer senses the environment by receiving real world data and turning it into something that can be understood by a computer. Data from multiple sensors is fused here using Machine Learning and Computer Vision to form a comprehensive reconstruction of our environment.

PLANNING

The Planning layer oversees the functioning of the entire system. Using the information from the perception layer, it formulates plans and then makes high level decisions. It is built on top of the ROS framework and is composed of multiple interconnected components all communicating with each other.


CREATIVITY IS
INTELLIGENCE
HAVING FUN


IMAGINATION IS
MORE IMPORTANT
THAN **KNOWLEDGE**

> Give me a place to stand and a lever long enough and I will move the World.
>
> - Archimedes

MECHANICAL

The Mechanical Division works with the modelling and manufacturing of various mechanical components required for the car. The division is also responsible for the maintenance and safety of the car .

DESIGN

The Design Subdivision is responsible for engineering various mounts for the sensors which are required to automate the car. 3D models of the component and the mount are created using CAD softwares and simulated on analytic softwares. The Subdivision is also responsible for proper placement of the sensors in order to get a 360 degree field of view for the car with no or minimal blind spots.

MECHANICS

Mechanics Subdivision ventures into the mathematical, kinematic and dynamic modelling of various robots. These are essential for the development of an effective control system for a robot. The Subdivision also provides the necessary equations and models required for simulations done by the Artificial Intelligence Division.

MANAGEMENT

The Management division plays an elemental role in the communication and organization of all the other units. It acts as the internal link that holds the team together. It is also responsible for organizing team events such as recruitments and doubles up as the body that handles the team's media front.

> Management is above all, a practice where art, science and craft meet
>
> - Henry Mitzberg

DESIGN & PUBLICITY

This Subdivision oversees work on media & publicity making sure that Project MANAS is active on various social media platforms. It ensures that the Project work is showcased to the public and that our followers remain updated about any new developments taking place, employing different mediums to connect with people such as posters, videos, blogs and through our website.

ADMIN & SPONSORSHIP

This Subdivision manages interviews with the media bodies, holds meetings with the University, handles finance, logistics, sponsorship, and other administration of the student project. It acting as a connecting link between the sponsors and Project MANAS and is also responsible for procuring funds.

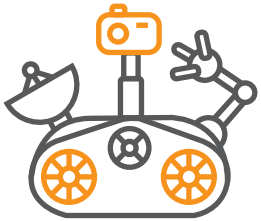

WHAT YOU CAN
MEASURE YOU CAN
MANAGE

TIMELINE

TOTAL **4** YEARS

CONCEPT

Cleared 'Concept' and 'Approach Note' round of Mahindra's Spark the Rise Challenge



PROTOTYPING : STAGE 2

Sponsorship of 'EVE', the Mahindra Reva e2o vehicle. Complete solution of autonomous vehicles in simulators. Fullscale implementation of algorithms on WALL-E.

START

15%

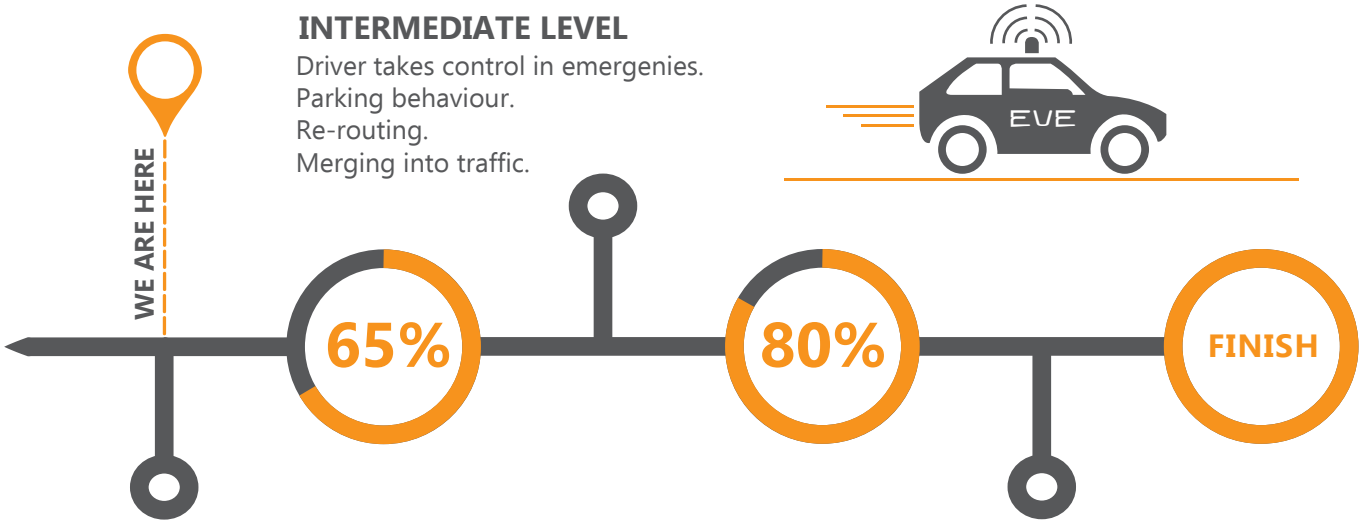
40%

Founded in MIT by **Kumar Ranjan** along with **Roshan Prakash** and **Shubham Verma**

PROTOTYPING : STAGE 1

Recieved an initial budget of 1.5 lakhs from Manipal Institute of Technology. Started work on functional prototype 'WALL-E'. Among top 13 teams to clear live demonstration round.

We're just passionate about **what we do.**

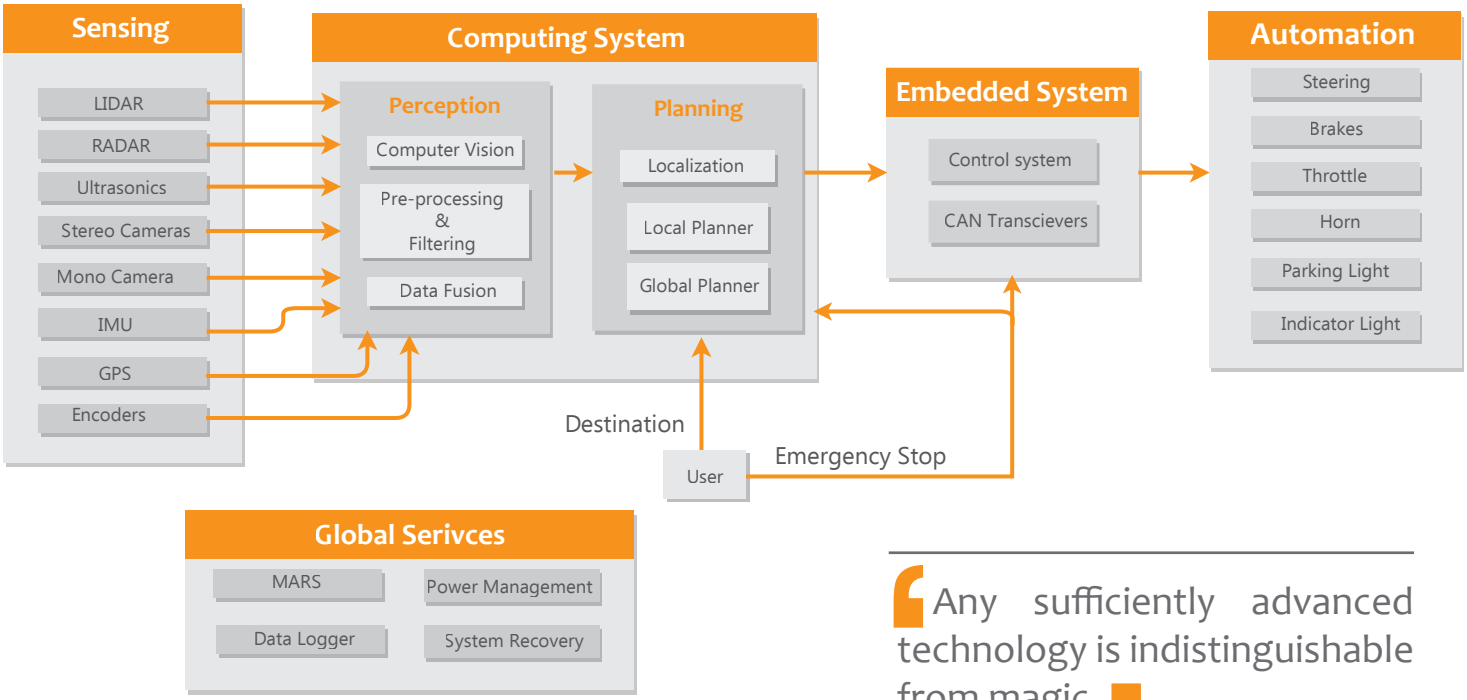


INTERMEDIATE LEVEL
Driver takes control in emergenies.
Parking behaviour.
Re-routing.
Merging into traffic.

EVE PROTOTYPE TEST AND BASIC LEVEL
Driver ready to take control.
Follows waypoints.
Responds to traffic signals and speed limits.
Emergency behaviours.
Basic interaction with other vehicles.

INDIAN CONDITIONS
No driver required.
Handling exotic situations and obstacles.
Irregular roads.
Interacting with horns.
Rain and night capabilities.

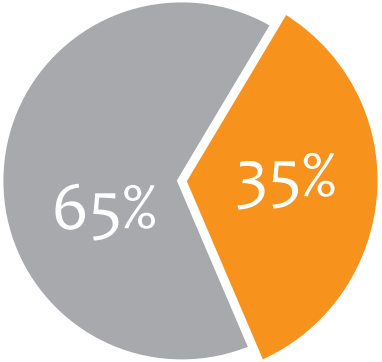
SYSTEM ARCHITECTURE



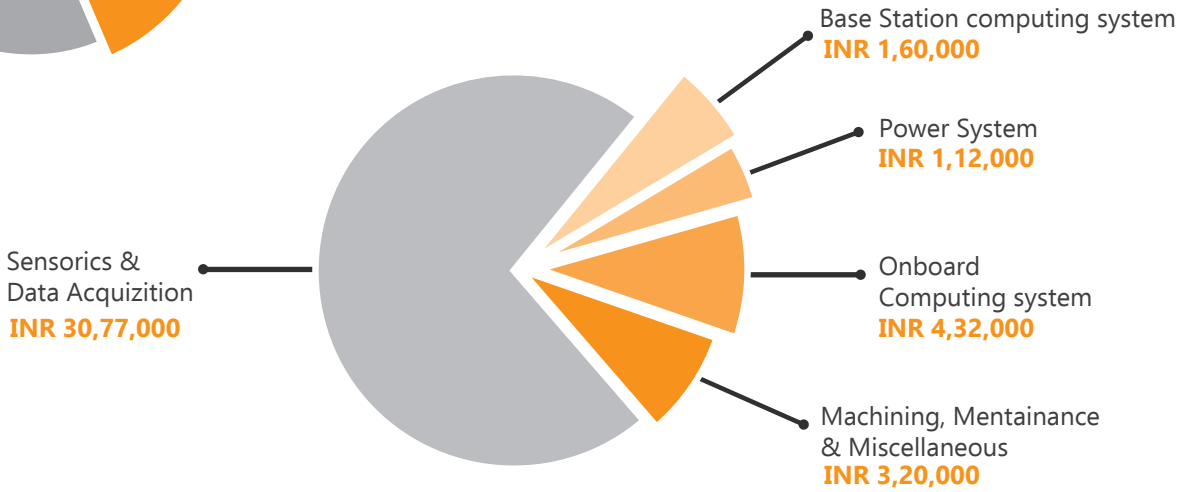
"Any sufficiently advanced technology is indistinguishable from magic."

Aurther C Clarke

BUDGET



Total Budget	Sponsored amount	Deficit amount
INR 41,01,000/-	14,50,000	26,51,000



THINK! SPONSORSHIP

Being among the top 13 out of the initial 259 that participated in the nation wide Mahindra Spark the Rise challenge, Project MANAS represents one of the most significant strides in modern technology.

PUBLICITY

A competition of such proportions and technological innovation would mean a great amount of promotion for your brand. By partnering with us, companies benefit from having their logo placed on our driverless prototype, banners and t-shirts.

GREATER OUTREACH

Over the years, a number of companies, corporates and other organizations have visited our workshop and campus for various competitions, events and placements. Also MIT, Manipal being one of the oldest private engineering college has a vast alumni network. This provides ample opportunities for networking, outsourcing and other business opportunities.

Every company's best asset is its employees. A company needs to procure new ideas and innovations, and a dedicated team ensures positive results. Manipal is home to over 20,000 students across all colleges. By working with us, you stand to come in direct contact with hardworking and talented employees brimming with energy.

Corporate Social Responsibilty

RESEARCH

Sponsoring a team like us goes a long way in ensuring the Corporate Social Responsibility of your company. Sponsoring such a research project is more like an investment in education that will help us as students to keep our dreams going. This initiative will change the way our society works and make the world a safer place to live in.

SAFE & ECO FRIENDLY

Over 1.3 million die every year as a result of road accidents. If left unchecked this will become a major cause for deaths by 2030. This can be avoided through the adoption of autonomous cars. Our driverless prototype will be an electric car, and thereby Eco Friendly, Doing its part in reducing India's Carbon Footprint. Also, driverless cars on the roads would completely eradicate traffic jams.

Your help towards us will go a long way in etching your image as a company working towards a better future.

BUY A BYTE ?

Plans	Byte	Kilobyte
Amount (₹) greater than	25,000/-	1,00,000/-
Logo on Car	-	S
Shout out on social networks	✓	✓
Name & Logo on website		✓
Logo on Apparel (T-Shirt)		✓
Logo on all event banners		
Credits in all publicity videos		
Presentation/Video at company exhibition		
Availability of car for live driverless demonstration		
Choice of logo position		
Attachment of company logo beside the team logo		
Inauguration of car		

Megabyte	Gigabyte	Terabyte	Petabyte	Exabyte
2,50,000/-	4,00,000/-	7,00,000/-	10,00,000/-	18,00,000/-
M	L	XL	XL	XXL
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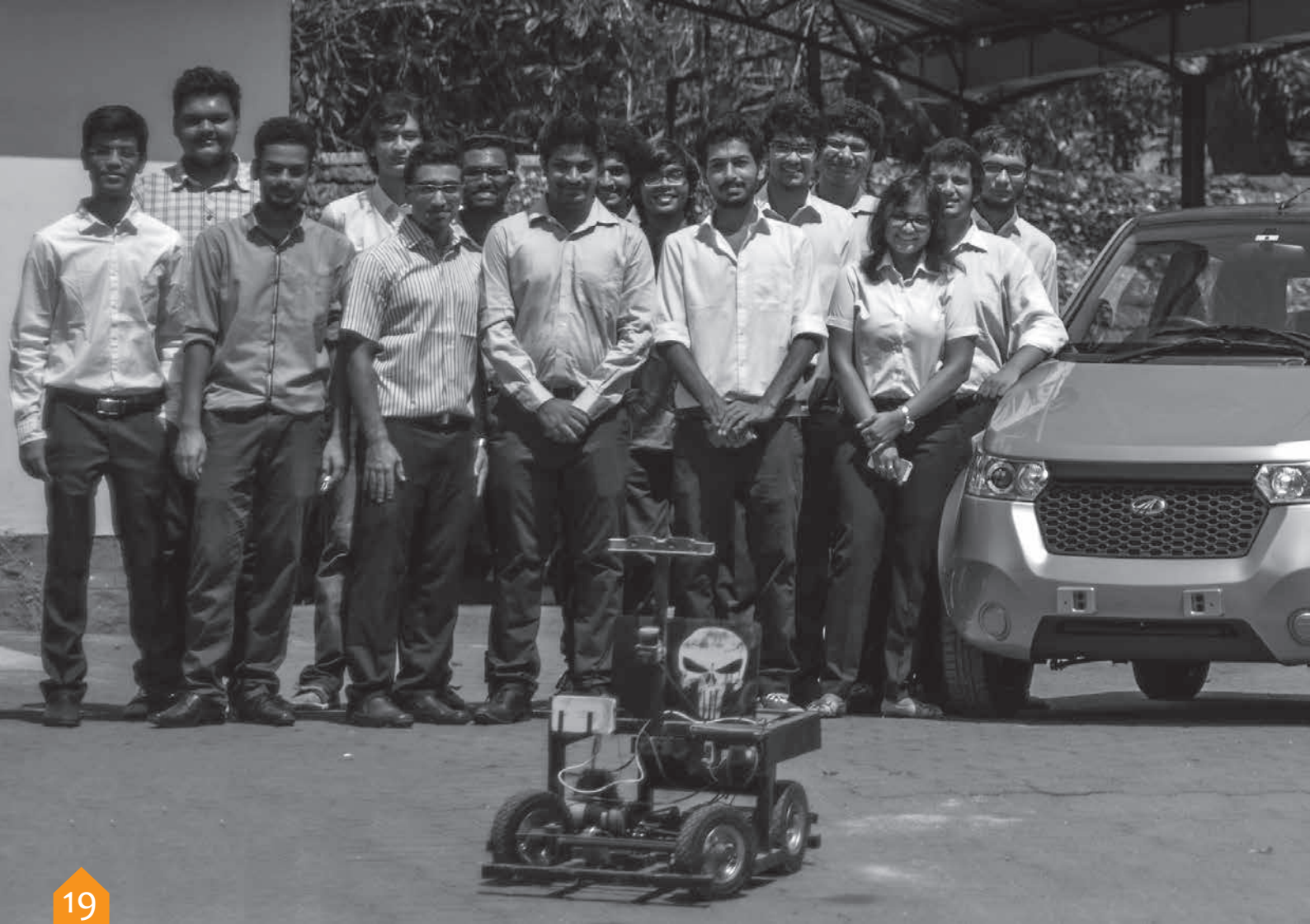

"Coming together is beginning, staying together is progress,

and working together is **Success.**"

-Henry Ford

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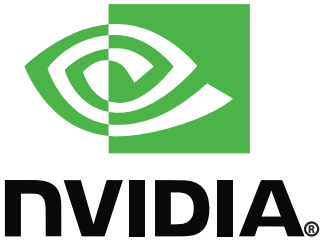
Sensor Intelligence.

NATIONAL INSTRUMENTS™

Continental

PEPPERL FUCHS
SENSING YOUR NEEDS

OUR SPONSORS



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