EASWARI ENGINEERING COLLEGE

(AN AUTONOMOUS INSTITUTION)

BHARATHI SALAI, RAMAPURAM, CHENNAI 600089

DEPARTMENT OF CSE

CONNECTRIX

2023 - 2024

DECEMBER

VOLUME 1

ISSUE 7

EASWARI ENGINEERING COLLEGE
AUTONOMOUS

COMPUTER SCIENCE AND ENGINEERING

VISION

To impart quality education in the field of computer science and engineering and to provide graduates with technical skills enabling them to contribute to the society by solving real world problems and to become a centre of excellence for advanced computing.

NEWSLETTER
DECEMBER EDITION
2023-2024
VOLUME 1 ISSUE 7

MISSION

M1. To provide strong foundation in computer science and engineering and in problem solving techniques to become successful professionals in the field of computing and prepare them for higher education.

M2. To provide students with latest skills in the field of computer science and engineering and to realize the importance of life-long learning.

M3. To produce graduates with the ability to participate in interdisciplinary collaborations and apply recent computing tools and technologies in new domains and industry.

M4. To produce graduates capable of ethically and responsibly approaching and committing themselves to the social impact of computing.

M5. To prepare students to communicate effectively and exhibit leadership qualities to work on diverse project teams.

M6. To provide research environment for students and faculty to undertake inter-disciplinary research in emerging areas.

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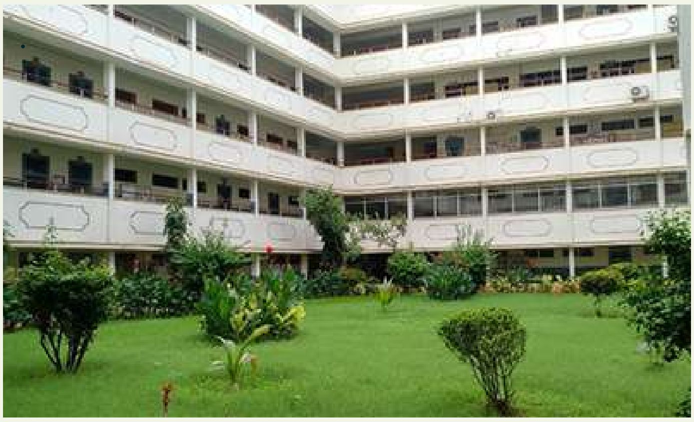


PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1

Graduates will possess the ability to think logically and have capacity to understand technical problems and to design optimal solutions for a successful career in industry, academia and research.

PEO 2

Graduates will have foundation in mathematical, scientific and computer science and engineering fundamentals necessary to formulate, analyze and solve engineering problems.

PEO 3

Graduates will have the potential to apply their expertise and current technologies across multiple disciplines to solve real world challenges and research issues.

PEO 4

Graduates will have the ability to work as a team and will be able to promote the design and implementation of products and services with an understanding of its impact on economical, environmental, ethical, and societal considerations through their strong interpersonal skills, leadership quality and entrepreneurial skills.

PEO 5

Graduates will possess an urge to learn continuously and to be responsive to the demands of the progressive industrial world by carrying out researches in frontier areas of computer science and engineering.

PROGRAMME SPECIFIC OUTCOMES

PSO 1

Analyze , design and develop computing solutions by applying foundational concepts of computer science and engineering.

PSO 2

Apply software engineering principles and practices for developing quality software for scientific and business applications.

PSO 3

Adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/ novel problems.

PROGRAMME OUTCOMES

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

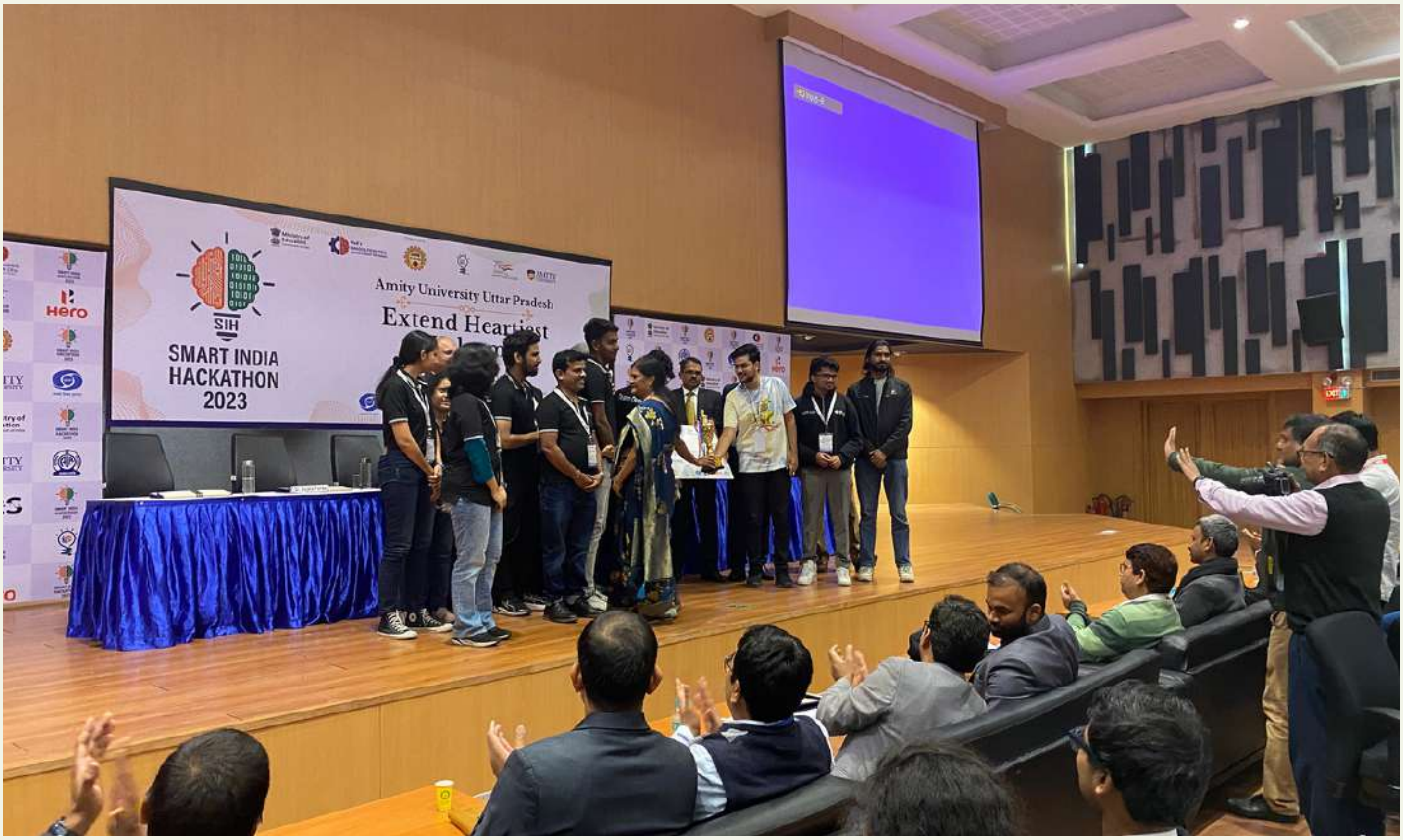
PLACEMENTS

S.No	LPA	NAME	COMPANY NAME
1	4 - 4.5	BHARANIDHARAN GANESAN	Accenture
2	4 - 4.5	SOWMYA SREE SURESH	Accenture
3	4 - 4.5	DEVNANDA KURUP	Accenture
4	4- 4.5	MADHAN RAJ RAMESH	Accenture
5	4 - 4.5	LAYA PRATHAP NAMBIAR	Accenture
6	4 - 4.5	BADRINATH BABU	Accenture
7	4 - 4.5	ARUNRAHUL SELVAKUMAR	Accenture
8	4 - 4.5	HARISHMA SUBRAMANIAN	Accenture
9	4 - 4.5	SHREYA PUGAZHENDHI	Accenture
10	4 - 4.5	RENY ABESHA	Accenture

11	4 - 4.5	SHRINILAMANGAI RANGANATHAN	Accenture
12	4 - 4.5	YEMINI GEHLOT	Accenture
13	4 - 4.5	PRETHE T	Accenture
14	4 - 4.5	SRIPRIYA T	Accenture
15	4 - 4.5	HARITTHA	Accenture
16	4 - 4.5	AVANTHIKA MANIMARAN	Accenture

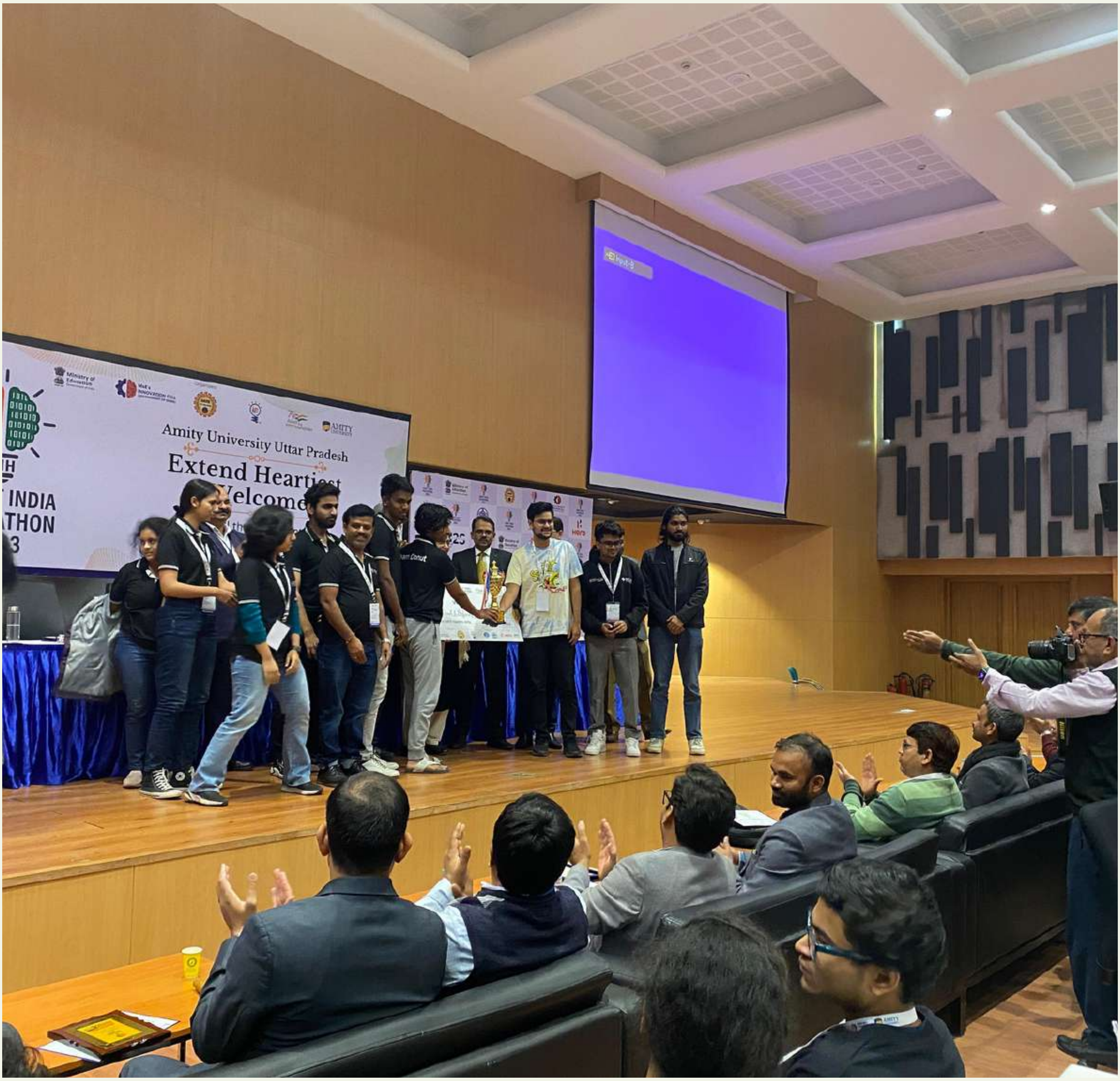
SIH(2023)

SMART INDIA HACAKATHON:



Our department's Staff (Dr.Devan) and our students of III year CSE B section participated in the Smart India Hackathon which took place on 19th & 20th December ,the prize money is Rs . 1 lakh the first place was shared between two teams and each of the team received Rs . 50,000/-

SIH(2023)



ARTICLE : AI IS BUILDING HIGHLY EFFECTIVE ANTIBODIES THAN HUMANS

AT AN OLD BISCUIT FACTORY IN SOUTH LONDON, GIANT MIXERS AND INDUSTRIAL OVENS HAVE BEEN REPLACED BY ROBOTIC ARMS, INCUBATORS, AND DNA SEQUENCING MACHINES. JAMES FIELD AND HIS COMPANY LABGENIUS AREN'T MAKING SWEET TREATS; THEY'RE COOKING UP A REVOLUTIONARY, AI-POWERED APPROACH TO ENGINEERING NEWMEDICAL ANTIBODIES. IN NATURE, ANTIBODIES ARE THE BODY'S RESPONSE TO DISEASE AND SERVE AS THE IMMUNE SYSTEM'S FRONT-LINE TROOPS.

THEY'RE STRANDS OF PROTEIN THAT ARE SPECIALLY SHAPED TO STICK TO FOREIGN INVADERS SO THAT THEY CAN BE FLUSHED FROM THE SYSTEM. SINCE THE 1980S, PHARMACEUTICAL COMPANIES HAVE BEEN MAKING SYNTHETIC ANTIBODIES TO TREAT DISEASES LIKE CANCER, AND TO REDUCE THE CHANCE OF TRANSPLANTED ORGANS BEING REJECTED.BUT DESIGNING THESE ANTIBODIES IS A SLOW PROCESS FOR HUMANS—PROTEIN DESIGNERS MUST WADE THROUGH THE MILLIONS OF POTENTIAL COMBINATION OF AMINO ACIDS TO FIND THE ONE THAT WILL FOLD

TOGETHER IN EXACTLY THE RIGHT WAY, AND THEN TEST THEM ALL EXPERIMENTALLY, TWEAKING SOME VARIABLES TO IMPROVE SOME CHARACTERISTICS OF THE TREATMENT WHILE HOPING THAT DOESN'T MAKE IT WORSE IN OTHER WAYS. "IF YOU WANT TO CREATE A NEW THERAPEUTIC ANTIBODY, SOMEWHERE IN THIS INFINITE SPACE OF POTENTIAL MOLECULES SITS THE MOLECULE YOU WANT TO FIND," SAYS FIELD, THE FOUNDER AND CEO OF LABGENIUS.HE STARTED THE COMPANY IN 2012 WHEN, WHILE STUDYING FOR A PHD IN SYNTHETIC BIOLOGY AT IMPERIAL COLLEGE LONDON, HE SAW THE COSTS OF DNA SEQUENCING, COMPUTATION, AND ROBOTICS ALL COMING DOWN. LABGENIUS MAKES USE OF ALL THREE TO LARGELY AUTOMATE THE ANTIBODY DISCOVERY PROCESS.

AT THE LAB IN BERMONDSEY, A MACHINE LEARNING ALGORITHM DESIGNS ANTIBODIES TO TARGET SPECIFIC DISEASES, AND THEN AUTOMATED ROBOTIC SYSTEMS BUILD AND GROW THEM IN THE LAB, RUN TESTS, AND FEED THE DATA BACK INTO THE ALGORITHM, ALL WITH LIMITED HUMAN SUPERVISION. THERE ARE ROOMS FOR CULTURING DISEASED CELLS, GROWING ANTIBODIES, AND SEQUENCING THEIR DNA:

TECHNICIANS IN LAB COATS PREPARE SAMPLES AND TAP AWAY AT COMPUTERS AS MACHINES WHIR IN THE BACKGROUND.HUMAN SCIENTISTS START BY IDENTIFYING A SEARCH SPACE OF POTENTIAL ANTIBODIES FOR TACKLING A PARTICULAR DISEASE: THEY NEED PROTEINS THAT CAN DIFFERENTIATE BETWEEN HEALTHY AND DISEASED CELLS, STICK TO THE DISEASED CELLS, AND THEN RECRUIT AN IMMUNE CELL TO FINISH THE JOB. BUT THESE PROTEINS COULD SIT ANYWHERE IN THE INFINITE SEARCH SPACE OF POTENTIAL OPTIONS. LABGENIUS HAS DEVELOPED A MACHINE LEARNING MODEL THAT CAN EXPLORE THAT SPACE MUCH MORE QUICKLY AND EFFECTIVELY. "THE ONLY INPUT YOU GIVE THE SYSTEM AS A HUMAN IS, HERE'S AN EXAMPLE OF A HEALTHY CELL, HERE'S AN EXAMPLE OF A DISEASED CELL," SAYS FIELD. "AND THEN YOU LET THE SYSTEM EXPLORE THE DIFFERENT [ANTIBODY] DESIGNS THAT CAN DIFFERENTIATE BETWEEN THEM.

The tests are almost fully automated, with an array of high-end equipment involved in preparing samples and running them through the various stages of the testing process: Antibodies are grown based on their genetic sequence and then put to the test on biological assays—samples of the diseased tissue that they've been designed to tackle. Humans oversee the process, but their job is largely to move samples from one machine to the next."When you have the experimental results from that first set of 700 molecules, that information gets fed back to the model and is used to refine the model's understanding of the space," says Field. In other words, the algorithm begins to build a picture of how different antibody designs change the effectiveness of treatment—with each subsequent round of antibody designs, it gets better, carefully balancing exploitation of potentially fruitful designs with exploration of new areas.

"A challenge with conventional protein engineering is, as soon as you find something that works a bit, you tend to make a very large number of very small tweaks to that molecule to see if you can further refine it," Field says. Those tweaks may improve one property—how easily the antibody can be made at scale, for instance—but have a disastrous effect on the many other attributes required, such as selectivity, toxicity, potency, and more. The conventional approach means you may be barking up the wrong tree, or missing the wood for the trees—endlessly optimizing something that works a little bit, when there may be far better options in a completely different part of the map.
You're also constrained by the number of tests you can run, or the number of "shots on goal," as Field puts it. This means human protein-engineers tend to look for things they know will work. "As a result of that, you get all of these heuristics or rules of thumb that human protein-engineers do to try and find the safe spaces," Field says. "But as a consequence of that you quickly get the accumulation of dogma."

FThe LabGenius approach yields unexpected solutions that humans may not have thought of, and finds them more quickly: It takes just six weeks from setting up a problem to finishing the first batch, all directed by machine learning models. LabGenius has raised $28 million from the likes of Atomico and Kindred, and is beginning to partner with pharmaceutical companies, offering its services like a consultancy. Field says the automated approach could be rolled out to other forms of drug discovery too, turning the long, "artisanal" process of drug discovery into something more streamlined.Ultimately, Field says, it's a recipe for better care: antibody treatments that are more effective, or have fewer side effects than existing ones designed by humans. "You find molecules that you would never have found using conventional methods," he says. "They're very distinct and often counterintuitive to designs that you as a human would come up with—which should enable us to find molecules with better properties, which ultimately translates into better outcomes for patients."

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EDITORIAL BOARD

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EASWARI ENGINEERING COLLEGE (AUTONOMOUS)
BHARATHI SALAI, RAMAPURAM, CHENNAI 600-089