Kavinaam of Tayaran

MARCH 2019

One more feather to our cap

BE- AEROSPACE ENGINEERING

Congrats new Office bearers CAE 2019

ANNUAL MAGAZINE 2019

The unexpected way of thinking starts here

Department of Aeronautical Engineering

Vision

The Department of Aeronautical Engineering envisions becoming a center of excellence, equipping the students with value and skill based education, pursuing globally relevant research and producing professionals committed to nation building.

Mission

- Impart quality technical education and unique interdisciplinary experiences
- Develop the analytical, computational and design capabilities to provide sustainable solutions
- Expose the students to the current trends and opportunities in the global Aerospace industry
- Inculcate professional responsibility based on an innate ethical value system

"KavinaaM of Tayaran" is combination of language gives the meaning "Great Thinkers of Aviation". KavinaaM is the word taken from the Sanskrit language giving the definition "Great Thinkers". Tayaran is the word which is been found from Arabic language means "Aviation".

View Point

In India, the field of Aerospace engineering is positioned for tremendous expansion in the coming years. There are several job openings in this field, both in the public and private sectors. Aerospace engineering is a well-paid job in other countries. The beginning salary ranges from $70,000 to $1,000,000 each year. From 2020 to 2030, the employment of aerospace engineers is expected to expand at a rate of 8%, which is approximately average for all occupations. Over the next ten years, an average of 4,000 jobs for aerospace engineers are expected. KCG College of Technology has launched a new degree, BE- Aerospace Engineering, to assist students in obtaining specialised training in the field.

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ALUMNI CORNER

CATHERINE REJULA PAUL

Team Lead Boeing India

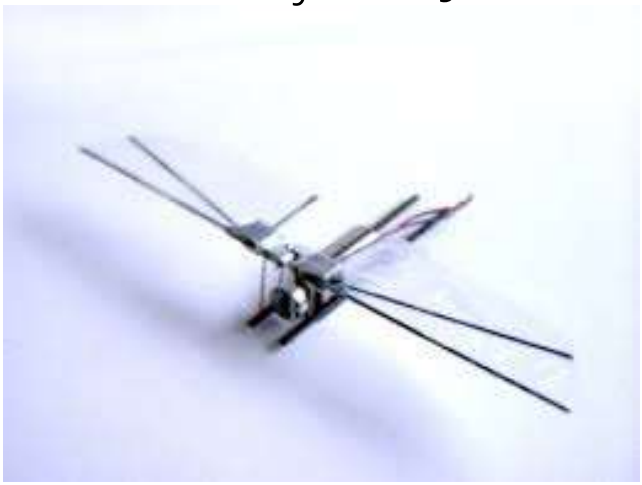
2009-2013

“The staff and resources at KCG college of Technology helped me fulfill my dream My department helped me mould my attitude to become a leader through the opportunities I was grateful to have earned. I will always owe my success to my professors who helped me become the person I am today. KCG always holds a very special place in my heart and it’s the place where I have utilized the best 4 years of my Life.“

BEST PROJECTS

Study of Flapping MAV wings

V. Ishwarya , C Jeniffer



This project is to experimentally investigate the fluid structure interaction for the various insect wings, in aspect of using it to micro aerial vehicle (MAV). The wing is then fabricated for the MAV configuration which is restricted to be within the size of 15 cm length and 15 cm width, all three wings with constant span length of 6cm each and varying surface area. The span area of each wing is calculated to determine the lift per unit area from the experimental testing. The force is being calculated with the help of Force Sensing Resistor (FSR), the output is taken as voltage and converted to the force. The wings that are been fabricated is fitted to an Ornithopter. The Ornithopter is designed to be qualify as a micro aerial vehicle. The Omnithopter is tested with the open blower and the lift force is determined by the calculation. The co-efficient of lift is calculated from the lift force which is then compared between themselves to conclude the best wing structure among them. This type of wing can be used for the spying purpose in the military zone and also can used to survey very tiny places where humans cannot enter. As a result, the best and efficient lift producing wing is been chosen.

BEST PROJECTS

RC Plane Control Using Smart Phone

Arunachalam, Srivatsan

One potential application for a smartphone type device is a flight management and control computer for an UAV. The hardware employed in most smartphones and tablets has the capabilities necessary to fly an air vehicle without an user interaction. The user can pre program in a flight plan and the smartphone will do the rest. The real challenge with using a smartphone as a flight management and control, the computer is the real time control of the aircraft. This project demonstrates how a real time control process can be implemented on an android phone

CONGRATULATIONS
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National Conference on Aeronautical & Mechanical Engineering -2017

The Department of Aeronautical Engineering & Mechanical Engineering conducted its National Conference on Aeronautical & Mechanical Engineering – 2017 (NCAME-2017) on 24th March 2017. The conference was basically to provide a platform for students, faculty members and research scholars to present their research work in Aeronautical & Mechanical fields. For the conference 100 papers from many institutions were received. 95 papers were shortlisted from various disciplines of Aeronautical Engineering & Mechanical Engineering. Out of which 80 papers participants attended the conference.

The conference began with the Invocation of Lord by the student choir and lighting of the divine lamp by the dignitaries on the dais. The Head of the Department of Aeronautical Engineering, Dr. R Asad Ahmed delivered the Welcome Address. Dr. K.Vijaya Raja, Professor, Department of Aeronautical Engineering gave a brief description about the conference. The Presidential Address was delivered by the Registrar Dr. C. Chinnaraj. The chief guest was Mr. N. Shekar, President of Aerospace Industry Development Association of Tamilnadu. He spoke about the expectation of Aerospace Industry from Engineers and to develop the traits in engineering students.

Dr. C. Chinnaraj felicitated the Chief Guest and Keynote address Speakers. Key note address from Aeronautical Engineering was delivered by Mr. B. Ruban Deva Prasath, General Manager, Brakes India Private Limited. He gave a lecture on Anti Lock Braking Systems and their benefits. The key note address from Aeronautical Engineering was delivered by Dr.E Natrajan, Professor, Institute of Energy Studies, Anna University. He gave a lecture on Sustainable Energy. The vote of thanks was delivered by Dr. N.Govindaraju, Head of the Department, of Manufacturing Engineering.

The papers were presented at two different venues based on Aeronautical & Mechanical Engineering.

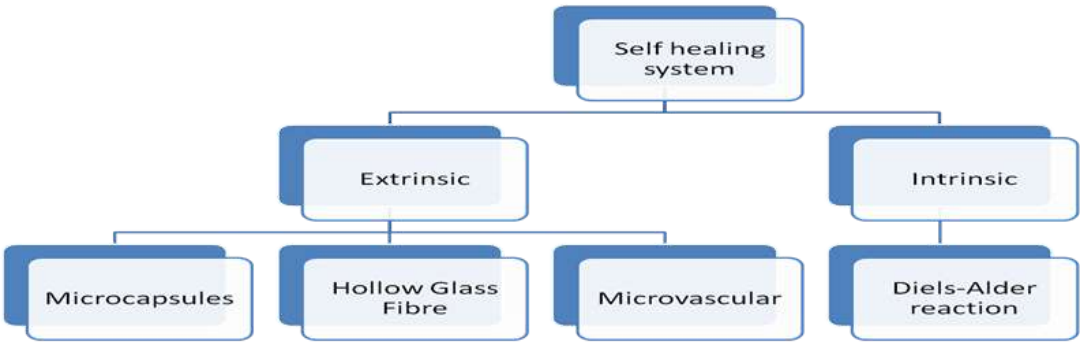
SELF-HEALING COMPOSITES FOR AERONAUTICAL APPLICATIONS

Syam Narayanan S

Structural composites made from continuous/long fibers in a polymer matrix offer a great potential in various sectors for reduced weight as well as reduced life-time maintenance costs, due to better corrosion and fatigue resistance. However, fiber reinforced polymer composites (FRC) can be difficult to repair when subjected to impact and environmental degradations.

Conceptual inspiration from nature is not new, and many engineering approaches can be considered to have been inspired by observing natural systems. The healing potential and repair strategies of living organisms is increasingly of interest to designers seeking lower mass structures with increased service life. Inspiration and mimicry of these microstructures and micro mechanisms offer considerable potential in the design and improvement of fiber composites.

In FRC impact force causes barely visible internal damages which are hard to detect, especially in its early stages when it may be easily repaired. Often this leads to rapid deterioration of material properties of the damaged part. Even if detected, repairing internal damage is quite difficult. Thus it is desirable to have a material that would "heal itself" in a similar fashion as biological systems.



A. Intrinsic self healing

This system refers to the polymer/resin repairing itself usually through the application of an external stimulus such as heat or light. Various chemistries has been tried for intrinsic self-healing.

1. Diels-Alder reaction

2. Polyethylene-co-methacrylic acid

3. Poly (Ɛ-caprolactone)

Much of work till date has used Diels-Alder reaction for intrinsic healing. Following damage the resin is able to undergo a reverse Diel-Alder reaction at elevated temperature to effect healing to recoup virgin resin properties

B. Extrinsic Self-Healing System

The extrinsic healing process is based on the use of a healing agent contained in the matrix as a separate phase. The healing agent is usually in the liquid state, placed in the form of microcapsules, hollow fibres or Micro-vascular. In most approaches, the healing agent is used with a catalyst, which can also be encapsulated or dissolved in the matrix. When damage occurs, local containers are broken, and the healing agent and catalyst are released, resulting in the healing of cracks, preventing crack growth and fracture failure of the structure.

The main extrinsic healing approaches are:

1. Microspheres- Healing agents are contained in the form of microcapsules, and catalysts are dispersed in the matrix. In a few cases, the healing agent can also react itself; in those cases, there is no need for a catalyst to initiate the process. When the material is damaged, the healing agent flows into the crack and repairs the crack with the aid of the catalyst

2. Hollow Glass Fibres- The healing agent is contained in the form of tubes, which is essentially the same as the microcapsules, and only the shape of the container is varied. In hollow fibres, the healing agent is delivered or released into the cracks when damage has occurred

3. The mesoporous (Micro-vascular) network contains healing agents or delivers them from an external reservoir, in case of damage.

The extrinsic healing concept is based on the response after or at the onset of damage. Furthermore, materials using extrinsic approaches are vulnerable to repeated damage at the same location. Also, healing of structures is not possible once the healing agents are used up or containers become empty. Current research focusses on improvement of healing agents and catalysts, and on new encapsulation techniques that can react without a catalyst when released.

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