## Alumni Reflections

## Message from the Director

**Dr K.L.Narayana**
Director
IcfaiTech, Hyderabad

*Dear Readers,*

It's been 12 years since the formation of the IcfaiTech, Faculty of Science & Technology (FST), as part of the ICFAI Foundation for Higher Education family. Since then, IcfaiTech has graduated outstanding and skilled graduates who have succeeded tremendously in their careers and, by extension, have also helped the school.

The Alumni Association of IcfaiTech helps us stay connected with students and lead the alumni to vast resources available here, from the faculty that taught and guided them to libraries, seminars and symposia. Many "stay connected" programs are designed with the alumni in mind. They are all designed to support you as you pursue your post-academic life and career and support the school in any way possible.

In this interest, we at IcfaiTech have started an Alumni Magazine, 'ECHO', a quarterly issue where the alumni share their research ideas, thought-provoking articles and much more to stay connected.

**I congratulate faculty and students of Alumni relations cell for bringing out the next issue of 'ECHO' and wish them success for future.**

### Alumni Relations Cell

| Faculty Team | Dr Digvijay V Nair (Faculty Incharge), Dr Hashmi S, Dr Vivekananda. K, Dr Divya, Dr H Sudheer |
|---|---|
| Student Team | Yasasvi (Secretary), Saisri, Santhosh, Anuhya, Meghana, Sidharth, Bhavitha, Dheeraj, Yashasri, Madhura, Vaishnavi, Sravani, Tanisha, Saber, Keerthana |

# EDITORIAL

We are thankful to all stake holders for the encouraging response received for the inaugural issue of Alumni magazine, 'ECHO'. The idea of launching such a magazine was to connect Alumni back to institute and get the benefits of the expertise and knowledge of Alumni to the students. Here we invite articles from alumni working in diverse fields enriching students with all latest techniques and ideas needed for their future prospects and setting higher goals for themselves.

This brings us to second issue of Alumni magazine. In this edition we are thankful to our Alumni who accepted the invitation and devoted time and space needed to prepare such wonderful articles. Alumnus Madhukar Dwivedi (2015-2019) gives us insightful and thought provoking glimpses in his journey through academia and research. The novel concept of stretching machine learning techniques and newer algorithms to match human neuro system and enhance existing ML capabilities will usher new opportunities. Followed by article from Vinayak Shukla, alumnus (2012-16, Mechanical Engineering) and M.Sc in in Naval Architecture & Ocean Engineering from Chalmers University of Technology- Gothenburg, Sweden having successful career in ship building and design writes techniques and ways employed in ship launching. The article from alumnus Major Sangeetha Nath (Alumnus, 2008-12) on robotic swarms (drones) presents futuristic aerial threats. Her article comes in two parts and second part to be released in next issue. The last article is from Sakalya Bhargava Satvik Sarma (Alumnus (2013-17), on identifying and cultivating Cultivating Entrepreneurial Fire in universities. Each one of the article tries to motivates students and prepare them for profession they decide to choose in future.

**Dr Digvijay Vishwanathan Nair**
*Faculty In-charge Alumni Relations Cell (ARC)*
*IcfaiTech Hyderabad*

# IcfaiTech
**Faculty of Science & Technology (FST)**



IcfaiTech provides quality education and training in the fields of science and technology

### Programs offered @ IcfaiTech
- B.Tech
- M.Tech
- B.Sc.
- BCA
- Ph.D (Full-time & Part-time) in Sciences

### Body of Knowledge
IcfaiTech integrates into its learning system an innovative and emerging body of knowledge. The following are its highlights:
- Cutting-edge course curriculum capturing the contemporary and effective pedagogy, with emphasis on both fundamentals and applications.
- Encouraging students to not only articulate science and technology needs but also provide appropriate solutions.
- Developing appreciation for synthesized multidisciplinary learning by way of internships, measurement techniques, workshop practices and other group learning assignments.

### Objectives
- To acquire a reputation as a highly purposive, innovative institution setting the pace for workable reforms in professional education, suitable and most relevant for the Indian cultural milieu.
- To provide high-quality, cutting-edge and career-oriented education programs in science and technology, to student population across the country.
- To provide highly motivated and successful science and technology graduates to meet the current and projected needs of the knowledge-workforce.

# IcfaiTech
**Faculty of Science & Technology (FST)**
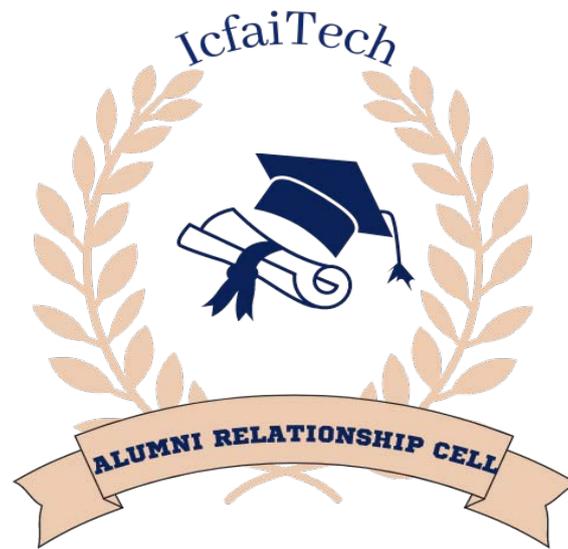
# Alumni Reflections

# Embracing Challenges

## My Journey through Academia and Research

**Madhukar Dwivedi**
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(2015-2019))
Ph.D. Candidate in Natural
Language Processing (NLP),
University of Amsterdam,
Netherlands
Data Scientist at ZS Associates,
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Gold Medalist, MS by Research in
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B.Tech. Graduate, ICFAI University
(2015-2019)

**My experience:**
Embarking on a journey through academia and the professional world, one quickly realizes the interconnectedness of various fields and their collective impact on our understanding of the world. My personal academic odyssey, spanning Machine Learning (ML), Neuroscience, and Natural Language Processing (NLP), exemplifies this interplay of technology and human insight.

**The Wider Landscape: The Convergence of Disciplines**
In today's fast-paced, tech-driven world, the boundaries between disciplines are increasingly blurred. The intersection of AI, ML, neuroscience, and other fields represents a frontier of untapped potential. It's in these intersections where groundbreaking discoveries and innovations are made - where we not only solve complex technical problems but also address deeper questions about human behavior and cognition.

**Beginning with Machine Learning: Addressing Societal Challenges**
My journey through the dynamic landscape of academia began in the classrooms of ICFAI University Hyderabad, where I pursued my

B.Tech in Computer Science. It was here that I first encountered the transformative power of Machine Learning (ML) and its potential to address real-world problems. My research, centered on using ML to mitigate food wastage, wasn't just an exploration of complex algorithms; it was an endeavor to harness technology for the greater social good.

### Overcoming Challenges in Research

The journey, however, was not without its challenges. One of the primary hurdles was the complexity of translating real-world problems into a format that could be effectively addressed through ML. The intricate process of collecting, analyzing, and interpreting data to make meaningful predictions about food wastage required not just technical skill but also a deep understanding of the societal factors at play. Overcoming these challenges involved countless hours of study, experimentation, and refinement of methodologies. It was a process that taught me the importance of resilience and adaptability in research.

### The Role of University Support

The support from ICFAI University during this period was pivotal. The faculty played a crucial role in shaping my research ideas, providing guidance that helped navigate the complexities of my project. Their expertise was invaluable in refining my approach and methodology. Additionally, the university's provision of resources, including access to an extensive library and state-of-the-art technology, was instrumental in my research.

Equally important was the university's support outside the lab. They provided funding for attending conferences and workshops, which opened new vistas of learning and networking opportunities. These experiences were crucial in broadening my understanding of ML and its applications and allowed me to stay abreast of the latest developments in the field.

Moreover, the university environment fostered a healthy work-life balance. This balance was essential in maintaining my well-being and productivity, reinforcing the idea that effective learning and research require not just hard work but also time for rest and personal growth.

### Exploring New Frontiers: Neuroscience and AI in My Master's Research

My academic journey took a fascinating turn at IIIT Hyderabad, where I ventured into the intersection of neuroscience and advanced technology for my Master's research. The thesis, titled "Effects of Meditation in Alzheimer's Disease," represented not just a foray into neuroscience but also a continuation of my exploration in AI and Machine Learning, applied in a novel context.

### The Convergence of Neuroscience and AI

The focus of my thesis was to understand how meditation, a non-traditional intervention, could potentially influence Alzheimer's Disease. This research was not just about neuroscience; it was about integrating AI and Machine Learning methodologies to analyze and interpret complex neurological data. The challenge lay in applying these advanced technologies to decipher the subtle changes that meditation could affect in the brain patterns of Alzheimer's patients.

The use of AI and ML in this context was groundbreaking. By employing sophisticated algorithms, I was able to analyze large datasets of neurological information, identifying patterns and correlations that might have remained elusive under traditional analysis methods. This integration of technology with neuroscience opened up new possibilities for understanding and potentially mitigating the effects of neurological disorders.

### Overcoming Research Challenges

The journey was marked by a series of research challenges. One of the most significant was the complexity of modeling the human brain, a task that required not only technical expertise but also a nuanced understanding of neuroscience. Additionally, the subjective nature of meditation and its effects on the brain added layers of complexity to the data analysis.

Overcoming these challenges required a multifaceted approach. It involved continuous learning, collaborating with neuroscientists and experts in meditation, and developing innovative ML models capable of handling the complexity of the data. This process was a rigorous exercise in problem-solving and innovation, pushing the boundaries of what I thought was possible in research.

### Sharing Lessons Learned

For students and researchers interested in exploring the intersections of different fields, my experience at IIIT Hyderabad is a testament to the possibilities that open up when you step beyond traditional boundaries. The fusion of AI, Machine Learning, and neuroscience is just one example of how combining diverse fields can lead to innovative solutions and deeper understanding. Embrace the challenges and complexities of interdisciplinary research; they are gateways to discovery and innovation.

### Bridging Academia and Industry: Real-World Applications at ZS Associates

Post my graduation, I joined ZS Associates as a Data Scientist, where I was thrust into applying theoretical knowledge to real-world business problems. This experience was invaluable, teaching me the nuances of translating complex data into actionable business strategies. Here, the importance of practical, application-based learning became clear - a crucial complement to academic research.

### The Current Pursuit: Unraveling Language with NLP

As I embark on my latest academic endeavor as a PhD candidate at the University of Amsterdam, I find myself immersed in the world of Natural Language Processing (NLP). This field, situated at the intriguing intersection of technology and human interaction, fascinates me as it involves the complex task of enabling machines to understand the subtleties of human language. My journey here, enriched by my experiences in AI, ML, and neuroscience, provides a distinctive lens to explore how technology intersects with human cognition and communication.

### Overcoming the Challenges of Entering the PhD Program

Entering the PhD program was not without its challenges. The initial hurdle was the highly competitive process of getting accepted into a prestigious program like the one at the University of Amsterdam. The field of NLP is rapidly advancing and highly sought after, making the entry process extremely competitive. Additionally, committing to a rigorous and demanding 4-5 year PhD program required a deep introspection of my goals and aspirations. It was a decision that necessitated not just academic readiness but also a long-term commitment to research and discovery.

### Navigating the Competitive World of NLP

The field of NLP is at the forefront of technological advancement, making it an exciting yet challenging domain to delve into. With continuous groundbreaking work being done, staying abreast of the latest developments and carving out a unique niche for my research required diligence and perseverance. The rapidly evolving nature of NLP means that one must constantly learn and adapt, pushing the boundaries of existing knowledge and techniques.

### Message to Aspiring Students

To students aspiring to venture into competitive and evolving fields like Data Science, AI, NLP, or any advanced area of study, I share insights from my own journey. Embrace the challenges you encounter; they are not just obstacles but indicators of a field's vast potential and opportunities for growth and impact. Prepare yourself thoroughly, both academically and mentally, for the commitment and dedication these fields demand. Remember, the journey through research and technology is one of continuous learning and adaptation. It's crucial to actively seek and utilize available support systems, including mentorship, resources, and professional development opportunities. Always stay curious and adaptable, as the landscape of technology and research is constantly evolving. Success often lies in your ability to innovate and adapt. Most importantly, understand that the pursuit of knowledge transcends academic achievements; it's about applying what you learn to make a meaningful difference in the world, shaping not just your future but also contributing to the broader landscape of human understanding and progress.

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# INTO THE BLUE
## An Overview of Ship Launching Techniques in Modern Shipbuilding

**Vinayak Shukla**
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Designation: Naval Architect, Ship Design
Company: Titagarh Rail Systems Limited,Kolkata, India
Post BTech.: Master of Science in Naval Architecture & Ocean Engineering from Chalmers University of Technology-Gothenburg, Sweden

It's a great feeling with which I am writing for students of IcfaiTech Hyderabad. It is the place where I studied mechanical engineering. Apart from studies I could participate in host of activities, technical events and contests both on and off campus. It laid foundation for a successful career for me. Later on I went to study Naval Architecture & Ocean Engineering in Sweden. Back in India, I joined Titagarh Rail Systems Limited in Kolkata. We are shipbuilders and cater to both commercial and defence sectors. Right now we are building 11 vessels for the Indian Navy. Previously (as in since I joined) we have built Patrol Vessel for Indian Coast Guard and a Cargo cum Passenger Ferry for Republic of Guyana.

The general consensus is that shipbuilding industry is on rise globally. However, in India we are still lacking shipyards capable of competing with the Chinese, Japanese, Korean and nowadays even Vietnamese. The closure of ABG, Pipav and Bharti shipyards in the past has significantly hurt our capacity and capability but hopefully they can comeback with new thrust and push from GoI under make in India initiative. I would share here An Overview of Ship Launching Techniques in Modern Shipbuilding

In shipbuilding, the launch of a vessel signifies a pivotal transition from construction on land to floating in water, a moment that not only marks a major milestone but also reflects the collaborative

efforts and expertise of the construction team. This dynamic and visually impressive phase, often celebrated with a launching ceremony, is where shipyards showcase their launching method, each tailored to the specific ship types and the yard's capabilities. Techniques range from traditional gravity-based launches to the more contemporary floating-out practices, demonstrating the adaptability and ingenuity required in maritime construction. It's important to note that launching a ship doesn't signal the project's end; rather, it's a strategic step to free up space for the next build. The launch is followed by extensive testing and trials of the ship and its onboard equipment before the vessel is finally commissioned and delivered to the client. This exploration into launching methods highlights not only the culmination of the construction process but also the intricate engineering and planning essential for transitioning a ship from the yard to its new life on the water.

### Gravitational Launch

In the realm of shipbuilding, gravitational launching, which includes both end and side launches, stands as a hallmark to traditional methodologies, harnessing gravity's pull to guide ships from construction to the sea. This technique is executed on slipways - inclined structures that lead directly to the water, serving as the launching pad for the vessel. During an end launch, the ship is oriented lengthwise along the slipway, with its stern (rear) or bow (front) facing the water. As gravity takes over, the vessel accelerates down the slipway, gracefully entering the water end-first. This method is typically employed in shipyards with adequate space and a suitable layout, allowing for a straightforward launch trajectory. Side launches, on the other hand,



FIGURE 1 END LAUNCH OF FAST PATROL VESSEL, ICGS KAMALA DEVI, AT TITAGARH RAIL SYSTEMS LIMITED (KOLKATA) ON THE BANKS OF HOOGHLY RIVER. THE SLIPWAYS CAN BE SEEN BELOW THE SHIP.



FIGURE 2 SIDE LAUNCH OF MONO HULLED (SINGLE HULL) PASSENGER CUM CARGO FERRY, MV MA LISHA, AT TITAGARH RAIL SYSTEMS LIMITED ON THE BANKS OF HOOGHLY RIVER. THE HEEL (TILT) OF THE SHIP POST LAUNCH IS EXPECTED AND A RIGHTING MOMENT CREATED AS A RESULT OF BUOAYNCY FORCE ACTING UPWARDS BRINGS THE SHIP BACK TO ITS UPRIGHT POSITION IN ORDER TO ATTAIN EQUILIBRIUM.



FIGURE 4  DRY DOCK AT AVIC DINGHENG SHIPBUILDING CO. LTD. , YANGZHOU, CHINA. TWO SHIPS UNDER THE ASSEMBLY PHASE CAN BE SEEN IN THE PICTURE WITH A DOCK GATE AT THE END.

*FIGURE 5 DRY DOCK AT COSCO SHIPPING HEAVY INDUSTRIES CO. LTD., YANGZHOU, CHINA. FLODDED DRY DOCK WITH THE SHIP BEING FLOATED OUT OF THE DOCK WITH THE AID OF PUSH & PULL TUG BOATS.*
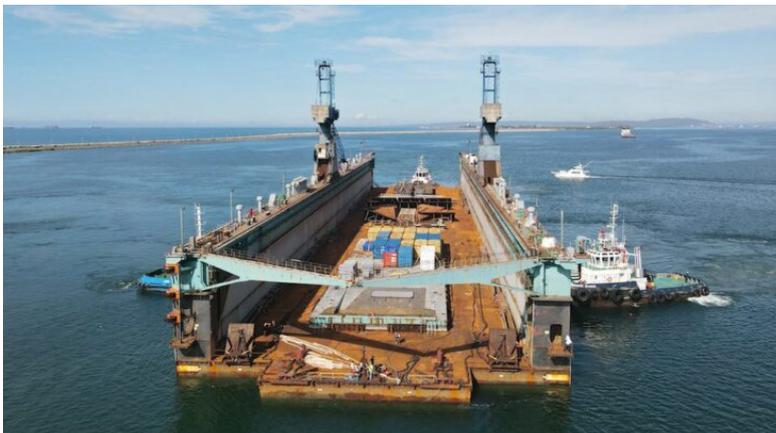


*FIGURE 6 JAMAICA'S FIRST FLOATING DOCK, 215 M LONG, OWNED AND OPERATED BY GERMAN SHIP REPAIR JAMAICA LIMITED*



*FIGURE 7 LAUNCH OF PLATFORM SUPPLY VESSEL (PSV), BRITOIL POWER, USING AIRBAGS. NOTICE THE INVERTED BOW HULL SHAPE AT THE FRONT. THIS IS CALLED THE 'ULSTEIN X-BOW' DESIGNED AND DEVELOPED BY THE ULSTEIN GROUP. THIS SHAPE AIDS IN REDUCING FUEL CONSUMPTION DUE TO LOWER HYDRODYNAMIC DRAG.*

position the ship parallel to the water's edge on the slipway. Once released, the vessel moves sideways into the water. This technique is particularly advantageous in shipyards constrained by space, such as those located along rivers, where the layout doesn't support end launches. Side launches are notable for their visual impact, creating a significant splash and wave as the ship makes its first contact with the water.

The decision to side launch or end launch a ship is purely logistical but both methods require rigorous planning, with considerations like the ship's weight and the slipway's angle being critical for a successful and safe transition. The depth of the water at the launch site, which can vary with the tide, is the most critical factor in determining the optimal timing for a ship's launch. For end launches, insufficient depth could result in reduced buoyancy at the tip of the ship entering the water, raising the risk of the vessel toppling over. In the case of side launches, a lack of adequate water depth may lead to a significant drop as the ship enters the water at the slipway's end, potentially compromising the ship's structural integrity and leading to damage. Due to these risks, no personnel are present on board during launch.

Despite the advent of more modern techniques, gravitational launching remains a preferred choice in many shipyards for its straightforwardness and proven effectiveness, embodying the blend of heritage and practicality in shipbuilding.

### Dry Docks

Dry docks greatly simplify the ship launching process. Their design allows for the dock to be flooded when convenient, enabling a smooth transition of the ship from land to water. These docks are also capable of constructing two ships at a time. The second

vessel, positioned at the landward end and is typically separated by an intermediate gate, can remain dry while the first is launched. This efficient setup allows for continuous construction, with the second ship moving forward for launch once the first is completed. This system not only maximizes crane usage but also provides ample time for detailed work on critical areas like the machinery spaces and living quarters.

The design of dry docks is such that the entire ship can be constructed within it. Stability and load calculations during the flooding process are essential. Access of the shipyard to river or sea inlets is essential for this. To control water entry into the dock, many shipyards install dock gates at the opening leading to the water. Some even add launching tracks for added efficiency. These gates are especially beneficial in regions with little tidal variation, like the Baltic or Mediterranean Seas. They enable shipbuilders to construct vessels in a dry setting and then flood the area when it's time for launch, ensuring a smooth and successful transition to water.

## Floating Dry Docks

An interesting alternative to conventional dry docks which require huge space on land are floating dry docks. Sometimes, a ship is built on land and then moved to a floating dock for launch. This setup resembles a ship lift, with rails that help transfer the completed ship onto the dock. Then, the dock can either be submerged right there or towed to deeper waters to let the ship float away. Another method involves using a pontoon, similar to how offshore structures are moved. Pontoons need extra buoyancy to stay stable during this process, typically provided by towers at each corner. This kind of pontoon,



FIGURE 9 EXAMPLE OF A SYNCROLIFT



FIGURE 10 LAUNCH OF US CARGO SHIP, SS WILLIAM CLARK, USING RAILS IN 1942

specialized yet less costly than a conventional floating dock, offers a practical solution for launching ships.

### Airbags

This method utilizes robust, cylindrical airbags strategically placed under the hull along a slope. As these airbags are gradually inflated, they gently lift and nudge the ship towards the water, culminating in a smooth launch. This technique is not only cost-effective but also minimizes the strain on the ship's structure. Ideal for shipyards with limited space or launching infrastructure, offering an efficient alternative to traditional launching methods. However, a higher level of risk is present as the motion of the vessel relies heavily on the airbags, lacking the controlled guidance of a slipway in gravitational launching. The vessel's movement is less predictable since it is not confined to a pre-determined path. No personnel are present onboard during launch.

### Ship Lift

Ship lifts, particularly the 'Syncrolift', are increasingly popular in shipyards for launching smaller vessels. This innovative system uses rail tracks to transport ships from the construction site to the lift. Originally designed for maintenance and inspection, the Syncrolift now plays a key role in launching new ships. The technique involves placing the ship on a beam-supported platform with winches, which lowers into the water, ensuring a controlled and gentle launch. This approach is not just effective for launching but also adaptable for ship repairs with the capacity to handle up to 20,000 tons.

### MARINE RAILYWAYS

This system although common in big shipyards in the previous century is now used in mostly smaller shipyards. It involves using a slipway equipped with a set of rails extending into the water. Here, the ship is either built directly on or transferred to a cradle that runs along these rails. When it's time for launch, the cradle is methodically lowered down the slipway, allowing the ship to gently float off into the water. This method offers a controlled operation, contrasting with the more dynamic and irreversible nature of traditional end launches. Additionally, akin to a ship lift system, this setup can be effectively utilized for bringing ships back for repairs or maintenance, adding to its versatility and functionality in the shipbuilding process.

In conclusion, our journey through the world of ship launches has revealed a spectrum of methods, ranging from traditional slipway slides to the use of airbags, and the sophisticated technology of ship lifts like the Syncrolift. Each technique is carefully selected to meet the specific needs of the ship and the shipyard's resources. Ship launching stands as more than a mere industrial activity; it represents a complex fusion of engineering acumen, concerted effort, and strategic planning. This exploration into the various techniques of launching ships underscores the considerable dedication and ingenuity required to guide these magnificent vessels from concept to their maiden voyage 'Into the Blue'.

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Design Engineering, Design Thinking, Data Analytics, Project Management

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# COUNTERING ROBOTIC SWARMS : (Part-I)
# INNOVATIVE SOLUTIONS TO FUTURISTIC AERIAL THREAT



**Sangeetha Nath**
(Alumnus, IcfaiTech Hyderabad, 2008-12)
Major Indian Army

### Introduction.

1. The United States Department of Defence has launched the search for a "Third Offset Strategy," an approach to sustain United States military technology superiority against potential adversaries. The first two strategies were aimed at "Offsetting" the Soviet numerical advantage in conventional weapons in Europe, first with nuclear weapons and later with information enabled precision-strike weapons. Focus of the third strategy is likely to harness the value of mass, which they strongly tried to "Offset" previously.

2. Uninhabited and autonomous system enables them to field a large number of assets at affordable cost resulting in the future of warfare, especially the air war drifting towards the employment of swarms. They can take greater risk and therefore are low-cost and expendable, or willing to accept some attrition.

### Understanding a Swarm.

3. A swarm consists of disparate elements that coordinate and adapt their move in order to give rise to an emergent, coherent and exponential threat. Ant colonies can build structures and wage wars, however a large number of un-coordinated ants can accomplish neither. Harnessing the full potential of the robotics revolution will require building a robotic system that are able to coordinate their behaviours, both with each other and with human controllers.

4. Robot swarms may consist of heterogeneous agents a mixture of different types of robots working together to perform a task. Large number of uninhabited aerial vehicles forming the robot swarm have several potential advantages as given below :-

(a) Combined power can be dispersed, giving the enemy more targets, forcing the adversary to expend more munitions.

(b) Mass allows the gradual degradation of combined power as individual platforms are attired, as opposed to a sudden loss in combined power if a single, more exquisite platform is lost.

(c) Missile batteries can be exhausted. Guns can only shoot in one direction at a time. Robotic swarms can overwhelm enemy air defence such that leakers get through, taking out the target.

(d) Targeting a swarm is difficult due to smaller individual platform size.

## Evolution of Swarming and Latest Developments in Drone Swarms.

5. Concepts for military swarming are largely unexplored. Increasingly autonomous robotic system allows the potential for swarming behavior, with one person controlling a large number of robotic systems. These developments raise important question: How does one fight with a swarm? How does one control it? What are its weaknesses and vulnerabilities?

6. Researchers have just begun to understand the answers to these questions. At a higher level, though, a look at the historical evolution of conflict can help shed light on how we should think about the role that swarming plays in warfare.
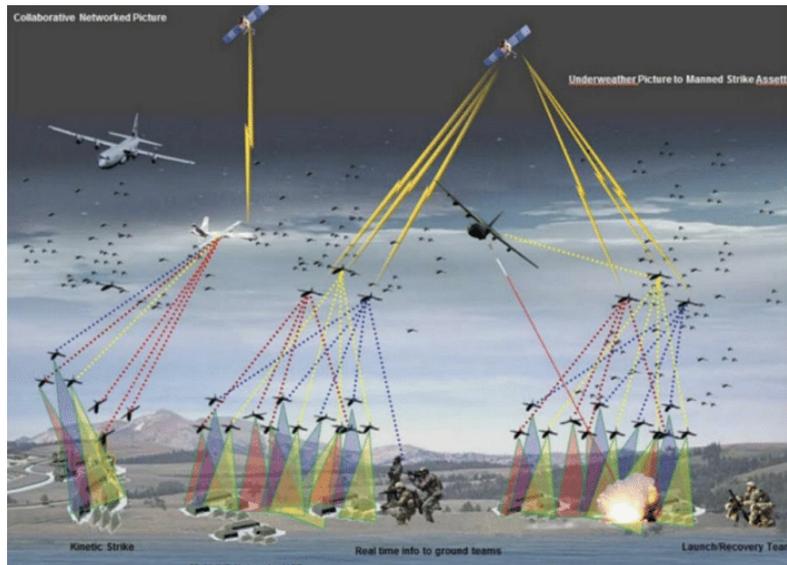


Fig 1 : Integrated Drone Swarm



Fig 2: US Navy LOCUST Tubular Autonomous Swarming UAV
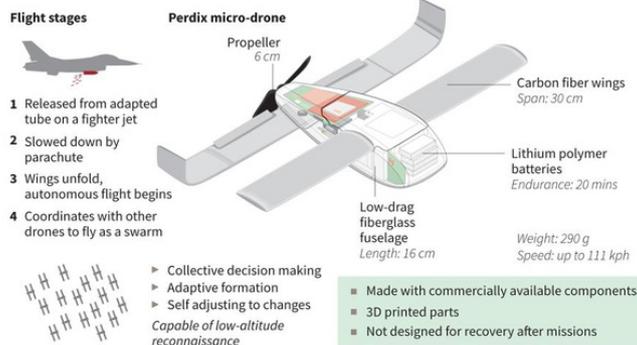


Fig 3 : Pedrix Micro Drones

**Latest on Drone Swarms.**

(a) **Low Cost UAV Swarming Technique (LOCUST).**
As part of its roadmap for the future, use of unmanned systems, the office of Naval Research of United States of America has developed the LOCUST program, which fires 30 Coyote UAVs from a tube-based launcher. LOCUST seeks to apply core swarm principles to the realm of naval warfare, where large numbers of LOCUSTS could potentially substitute for a single, expensive, anti-ship missile when engaging a major surface ship. It is both cheaper and far more capable of defeating the defensive systems in the maritime environment.

(b) **United States Air Force Swarm Project.** In January 2017, the United States Air Force carried out trials with 103 Perdix quadcopter drones functioning as a swarm. The trial included air dropping of these drones in the battlefield from canisters carried by three F/A-18 fighter aircrafts, gathering the drones in a swarm and then proceeding to engage targets in the battlefield. Perdix are a collective organism, sharing on distributed brain for decision-making and adapting to each other like swarms in nature. Since each Perdix communicates and collaborates with every other



*Fig 4 : Chinese 119 fixed Wing UAVs*

Perdix, the swarm has no leaders and can gracefully adapt to drones entering or exiting the team.

(c) **Other Swarm Projects World Wide.** In 2016, China demonstrated drone swarming 119 fixed wing drones breaking previous records of 67 drones. Russia has reportedly been working on a concept of drone swarming wherein Russian drone are flying in formation over their skies, Russia is also probably trying to integrate drones with its 'sixth generation' fighter aircrafts.

## Conclusion

Affordability, software domination, reduction in mission costs and risk reduction are some of the consummate advantages that swarm technology promises in military campaigns. Drone swarms could be engineered out of COTS components and are software dominated. These aspects would probably lead to their quick proliferation even among not -so- affluent militaries and even terrorists. Though employment of swarms technology is still a nascent phase, its future dominance is inevitable. It would be prudent to be prepared to both harness the technology is that it must be capable of adapting to changes which too are inevitable after fielding of the same. While initially, the focus would be developing technology to harness the prowess of mass, all development must be guided by well thought out document of likely employment. Moreover, the armed forces must be open to the idea of employment of robotic swarms in all dimensions and facets of warfare. To be ahead of our adversaries in military capabilities we need to think ahead and commence research to meet futuristic military challenges.

# Cultivating Entrepreneurial Fire:
## Why Universities Matter

**Sakalya Bhargava Satvik Sarma**
(Alumnus (2013-17), IcfaiTech Hyderabad)
Designation: Director Marketing
Company : Ingenious Advertising Pvt Ltd
& Luxe Casa Interio Pvt Ltd

My personal journey from a grade-chasing student to a entrepreneur highlights the pivotal role universities play in fostering entrepreneurial spirit. Raised in a family of salaried professionals, my initial path was paved with the familiar mantra of "good grades, good job." However, stepping into the vibrant ecosystem of ICFAI University proved to be a transformative experience.

Immersed in an atmosphere pulsating with entrepreneurial energy, I was exposed to diverse perspectives and ambitious dreams. Interacting with students from business departments, many from entrepreneurial families, broadened my understanding of success beyond the confines of a traditional paystub. Their narratives of freedom, impact, and building something their own resonated deeply, igniting a dormant desire for control over my time and destiny.

Notably, the unwavering belief and support of my father, Professor Venkata Seshaiah Sakalya and my brother, business partner and my super senior at ICFAI, Mr.Sai Chandra Goud Mothe, played a crucial role in emboldening me to embrace the unknown.

The entrepreneurial path was not without its challenges. Doubts, setbacks, and moments of uncertainty were inevitable companions. However, the lessons absorbed at university – resilience, resourcefulness, and unwavering faith in the power of ideas – became my shield. Brick by brick, we

had built Ingeinous Advertising Pvt Ltd our own venture, which today stands as a testament to the transformative power of a nurturing environment. With a team of 38 passionate individuals serving clients across the globe, our horizons continue to expand with each passing day.

My story is not merely a personal testament, but a powerful advocate for the importance of fostering entrepreneurial ecosystems within universities. By providing exposure to diverse possibilities, encouraging risk-taking, and equipping students with the necessary skills and resources, universities can empower a generation of young minds to break free from conventional paths and pursue their entrepreneurial dreams.

### specific initiatives that universities can implement to Cultivating Entrepreneurial Fire

### 1. Curriculum Reimagined:
▸ **Entrepreneurship 101:** Integrate foundational courses on entrepreneurship, business basics, and financial literacy into mainstream curriculums across all disciplines.
▸ **Case Studies and Simulations:** Learning by doing is key. Incorporate real-world case studies and business simulations to provide students with a taste of the challenges and rewards of entrepreneurship.
▸ **Interdisciplinary Collaboration:** Encourage cross-departmental collaboration through joint projects, workshops, and hackathons. This exposes students to diverse perspectives and fosters innovation.

### 2. Nurturing an Ecosystem:
▸ **Incubation Centers:** Establish and support on-campus incubation centers that offer workspace, mentorship, and resources for budding entrepreneurs.
▸ **Guest Speakers and Mentors:** Invite successful entrepreneurs and industry leaders to share their experiences and provide guidance to students. Build a network of mentors who can offer personalized support and advice.
▸ **Competitions and Awards:** Organize entrepreneurship competitions and award programs to incentivize students to develop their business ideas and gain recognition.

### 3. Skills and Resources:
▸ **Workshops and Bootcamps:** Conduct practical workshops on pitching, market research, legal aspects, and fundraising to equip students with the necessary skills to launch their ventures.
▸ **Access to Capital:** Connect students with potential investors and funding avenues to overcome one of the major hurdles of starting a business.
▸ **Networking Opportunities:** Facilitate networking events and conferences that connect students with potential collaborators, investors, and customers.

### 4. Fostering a Culture of Innovation:
▸ **Hackathons and Idea Jams:** Encourage creative problem-solving by hosting hackathons and idea jams that challenge students to develop innovative solutions to real-world problems.
▸ **Entrepreneurial Clubs and Societies:** Create student-led clubs and societies dedicated to entrepreneurship, where students can share ideas, collaborate, and learn from each other.
▸ **Celebrating Failure:** Reframe failure as a learning opportunity and celebrate risk-taking. Create a culture where experimentation and innovation are encouraged, even if they lead to setbacks.

These are just a few sparks to ignite the entrepreneurial fire within university walls. Remember, the key is to create a holistic ecosystem that supports and empowers students from the initial seedling of an idea to the blossoming reality of a successful venture. By implementing these initiatives and prioritizing a culture of innovation and risk-taking, universities can play a transformative role in unleashing the entrepreneurial potential of a generation and shaping a future where young minds don't just seek jobs, but create them.

Let's turn our campuses into crucibles of creativity, where ambition is embraced, ideas are celebrated, and the entrepreneurial spirit blazes brightly, illuminating the path to a brighter future for all.

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