KAMMAVARI SANGHAM (R) - 1952
K. S. INSTITUTE OF TECHNOLOGY
(Affiliated to VTU, Belagavi & Approved by AICTE, New Delhi)
#14, Raghuvanahalli, Kanakapura Main Road, Bangalore - 560109
Tel : 080 - 28435722 / 24 Fax : +91-80-28435723 Email : principal.ksit@gmailcom Web : www.ksit.ac.in

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ENLANATION

MECHANICAL DEPARTMENT NEWSLETTER

CONTENTS

Sri Y Ramachandra Naidu
President

Sri K Venkatesh Naidu
Secretary

Sri D Rukmangada
Treasurer

It gives us immense pleasure to present the Seventh Edition of "EMANATION" Newsletter. Emanation is the brainchild and the collective effort of the young and exuberant students of the Mechanical Department with active support from faculty members, especially the editorial team. We are sure avid and discerning readers will enjoy reading and developing the newsletter.

GOOD LUCK

I am pleased to take note of the hidden talents available among the students who come to KSIT for a professional degree and leave the portals of our institution as a fully blossomed professional who has discovered himself and his potential to contribute to the society. At KSIT, we strongly believe in overall development of our students with adequate social responsibility and sensitivity. I am very happy that my colleagues in the Department of Mechanical Engineering have been very successful in spotting the talents in our students and harnessing them and enabling our students to learn beyond the syllabus content through experiential learning from various live and ongoing projects that are present in our institution. All their efforts and learning are being showcased in this newsletter "EMANATION". I wish the staff and our talented students the very best in both their professional and personal lives.

Dr. K. V. A. Balaji
CEO

It's a pleasure to present the News Letter of Mechanical Engineering Department "EMANATION" for the year 2018-19. The ways we teach and the ways our students learn are unique and creative. Consistently, we took into our deficiencies and transform us to an efficient builder of social change. This edition contains the exciting activities done by our staff and students, moreover it contains the latest innovations in the field of automobile engineering. Many critics would confirm that the college has substantially contributed to the process of National Development by providing quality education and thereby enabling the students to become globally competent engineers. We have excelled in every initiative that we undertook and we have stood together in facing the challenges in realizing quality education.

Dr. T. V Govindaraju
Principal / Director

I am happy to note that the Department of Mechanical Engineering is bringing out one more newsletter. Being one of the senior Departments of the institution with well qualified and experienced faculty, the Department of Mechanical Engineering is continuously contributing for the overall development of the institution. The Department is encouraging the students in various academic, co-curricular and extracurricular activities. The release of this News Letter is one of such initiatives which focuses the activities of the students and highlight the latest developments of Technology in Mechanical Engineering. I understand that the theme focused in the present News letter is the latest developments in the field of Automotive Engineering. I congratulate the entire News Letter team for their efforts in bringing out this.

Dr. K. Rama Narasimha
Professor and Head
Mechanical En gg

Thought from Editors

Greetings and a warm welcome to our Seventh Edition of "EMANATION". Just like gods and the auras churned the ocean of milk to extract the nectar, we have tried to churn out the creativity from this mess of science. This time we made an attempt to bring out the talented concealed within our community. This issue includes article, resume building, interview with the alumni, research papers and much more. We hope you enjoy reading this issue as much as we have enjoyed making much. Any suggestions or criticism on the newsletter would be welcomed.

Lastly we thank all the members who made this edition possible.

- Team Emanation

INTRODUCTION

A **MONOWHEEL** is a one-wheeled single-track vehicle similar to a unicycle. Instead of sitting above the wheel as in a unicycle, the rider sits either within the wheel or next to it. The wheel is a ring, usually driven by smaller wheels pressing against its inner rim. Most are single-passenger vehicles, though multi-passenger models have been built.

Hand-cranked and pedal-powered monowheels were patented and built in the late 19th century, most built in the 20th century have been motorized. Some modern builders refer to these vehicles as **MONOCYCLES**, though that term is also sometimes used to describe motorized unicycles.

Today, monowheels are generally built and used for fun and entertainment purposes, though from the 1860s through to the 1930s, they were proposed for use as serious transportation.

The world speed record for a motorized monowheel is 98.464 km/h (61.18 mph).

ABOUT MONOWHEEL IN DEPTH

The monowheel became something of a trend between world wars, when excited visions of the future seemed to spring from the joy that there even would be a future. Although dozens of varieties rolled out over the years since the 1860s, you're unlikely to see one. They now exist mostly in patent applications, magazine covers, and a handful of garages. Unsurprisingly, they've made plenty of appearances in sci-fi flicks, adding a measure of cool to otherwise medicore movies.

The basic principle of the monowheel is easy to understand: Build a big enough wheel, and you can put a rider insider of it along with a motor to move the whole works forward. Early versions featured various combinations of motors (gas, electric, pedal-powered) and gear assemblies and are said to have reached speeds up to 93 mph–though their manufacturers were known to claim ludicrous speeds. Some versions were refined into relatively practical, not-totally-guaranteed-to-kill-you ways of getting around, if you're brave enough to hop in.

It was and remains a generally precarious mode of transportation. Besides the obvious degree of exposure and narrow point of balance, depending on the model (some featured little antennae-like balancing wheels, arguably rendering them non-mono) riders must learn to use their feet on the asphalt in order to counter the tilt of the wheel. If it's not properly stabilized, or a driver is too fast and loose with the gas or brake, “gerbling” is a real risk.

STEERING SYSTEM

In a two-wheel mode of transportation, two systems (wheels) affect motion. Typically one wheel provides the force to control speed, while the other handles changes in direction: steering. For a monowheel, both direction and speed are controlled through the same physical apparatus; this generally makes steering more difficult. In a majority of systems, change in direction is effected by the rider shifting his or her weight, or in the sudden movement creating a shearing force between a handhold and the axis that the driver is settled on. Better control can usually be achieved at lower speeds. Because of the steering problem, monowheels have never caught on as a widely accepted mode of transportation.

A change in direction can be effected in several ways including:

- Leaning. The most common steering solution is that the rider must lean towards his intended direction of travel to turn, and then centralize his weight again once the turn is complete.
- Turning a gyroscope to provide turning force.
- Outboard skids to provide friction drag on one side.
- At speeds faster than a walk, lightly dragging a foot on the ground will cause the wheel to lean to the opposite side. Drag the other foot to bring it back upright.
- Small wheels used for steering, either one to each side or a single unit either in front of or behind the vehicle. It is a matter of debate as to whether such a vehicle would still properly be called a monowheel.
- Steerable propellers, which could provide both steering and power to move the vehicle. It has been noted that having a propeller operating near pedestrians could be quite unsafe.
- Steerable tail surfaces, similar to those on airplanes. This solution would not work at low speeds.

ISSUES OCCURED

- Limited horizontal stability. A single wheel can fall over, unless it is quite wide or has some form of active stabilization, such as a gyroscope. Some designs have used outrigger skids or small wheels to address this. In many one-person designs, being at a stop requires the driver to put their feet on the ground, the same way as on a motocycle.
- Limited capacity. Monowheels tend to be larger than a car of similar carrying capacity. Most have been kept small by being built to carry only one rider and with little or no space for baggage.
- Risk of "gerbiling". In most designs, if the driver accelerates or brakes too hard, it is possible that the force applied overcomes the force of gravity keeping the rider at the bottom of the wheel, sending the rider spinning around the inside of the wheel. This is known as gerbiling because it has some similarity to the situation of a gerbil running too quickly inside of a hamster wheel.
- Visibility issues. In driver-inside designs, the rider is always facing the inner rim of the wheel, which can obstruct the view of oncoming hazards from all angles.

VARIANTS AND RELATED VEHICLES

There have been many proposals for variants or uses, such as a horse-drawn monowheel or a monowheel tank. A variant was proposed that placed two riders outside of the wheel itself, with one person on each side to provide for balance. An electric monowheel called Dynasphere was tested in 1932 in the United Kingdom.

One interesting variant called a RIOT wheel was presented at Burning Man in 2003. It involves the passengers sitting in front of the wheel and being balanced by a heavy counterweight inside the wheel. Rather than the typical ring drive, this vehicle is powered through a sprocket attached to the spokes.

A company in the Netherlands began taking custom orders of a monocycle configured variant called the Wheelsurf in 2007.

A related vehicle is the diwheel or the dicycle, in which the rider is suspended between or inside of a pair of large wheels placed side by side. An example of this would be the character Axel from Twisted Metal series of video games published by Sony.

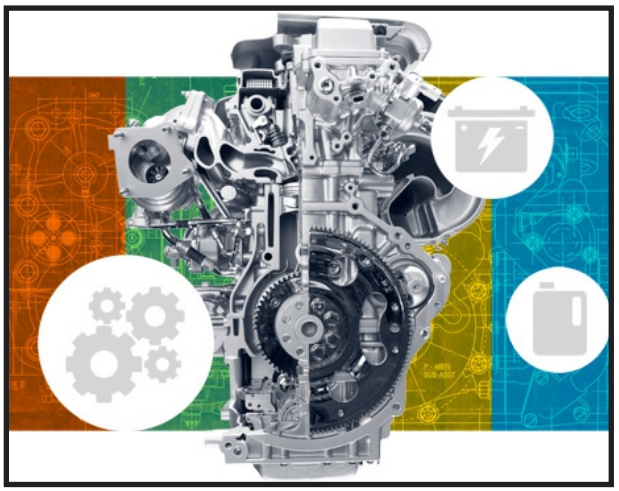
In 1971, an American inventor named Kerry McLean built his first monocycle (aka monowheel). In 2000, he built a larger version, the McLean Rocket Roadster powered by a Buick V-8 engine, which subsequently crashed in 2001 during the initial test run. McLean survived and proceeded to build over 25 different variations of his version of the monocycle, from pedal powered models, 5HP models, all the way up to V8 powered models.

In 2010, Nokia utilized two of McLean's monocycles in their commercials promoting the new Nokia SatNav smartphone.

In McLean's latest creation, the 2011 McLean V8 Drag Wheel, the wheel itself was machined out of a single piece of high-strength aircraft grade aluminum billet.

In the 2009 anime Yu-Gi-Oh! 5D's, Jack Atlus' D-wheel, the Wheel of Fortune, is based off the monowheel, albeit with high-speed racing capable modifications.

EMERGING TRENDS IN AUTOMOTIVE ENGINEERING



Not too many people know automotive trends the way the staff does at The Ohio State University's Centre for Automotive Research (OSU CAR). This interdisciplinary research center at OSU's College of Engineering focuses on advanced electric propulsion and energy storage systems, engines and alternative fuels, intelligent transportation and vehicular communication systems, autonomous vehicles, vehicle chassis systems, and vehicle safety.

"One of the biggest trends right now in automotive engineering is improving engine efficiency and fuel economy," says Giorgio Rizzoni, director of OSU CAR. "This includes downsizing, down-speeding, direct fuel injection, and boosting."

Other engineering trends focus on improving transmissions (adding speeds), accessory load reduction through the intelligent energy management of other vehicle components, vehicle electrification, hybridization, improved battery management systems, new battery chemistries, and power electronics.

"Weight reduction in vehicle subsystems is also being tested by using lightweight structures made from alternative materials such as aluminium, magnesium, composites, plastics, and multi-material construction," adds Rizzoni.

OSU CAR battery aging laboratory. Image: OSU CAR

BATTERY SYSTEMS

Battery management systems are being designed to meet performance, life, and warranty goals for both batteries and their monitoring and management systems. "Automakers need to fully understand how varying operational limits affect the life of battery systems through extensive testing and modelling, followed by developing sophisticated algorithms to track and predict various parameters, such as state of charge and state of health through the life of the battery," comments Rizzoni.

In order to expand battery operating range and reduce costs, some researchers are designing and testing new battery chemistries and subsystems. Advanced chemistries could allow batteries to operate through greater temperature extremes, last longer, and reduce weight and cost. Other efforts are being made to reduce the cost of the ancillary systems, such as cooling, to further reduce the total cost of the battery system.

DOWNSIZING AND TURBOCHARGING

The two main benefits in downsizing an internal combustion engine are thermodynamic and mechanical. "From a thermodynamic point of view, the engine operation will move towards higher loads, at which the engine efficiency is higher," says Rizzoni. "From the mechanical point of view, the positive aspect lies in the reduction of the friction in the piston units, together with the reduction of the number of cylinders."

Downsized engines are lighter than conventional engines, thereby reducing vehicle mass and the improving vehicle fuel consumption. Turbocharging recovers the energy of the exhaust gasses to increase the inducted charge, therefore increasing the power-to-displacement ratio. "A downsized and turbocharged engine has the potential to have the same or better performance as a non-downsized, normally aspirated engine, with the advantage of a significant increase of fuel efficiency," says Rizzoni.

ADVANCED COMBUSTION MODES

Engineers are working to increase the efficiency of internal combustion engines by developing several advanced combustion modes. One of these modes is called (homogeneous charge compression ignition) HCCI. In the HCCI combustion, a highly homogenized mixture of air, fuel, and combustion products from the previous cycle is auto-ignited by compression. "This combustion mode aims at combining the advantages of modern diesel and gasoline combustion processes, namely low emissions and high efficiency," states Rizzoni.

Another research trend targets ways to recover the energy that is normally dissipated through the coolant and the exhaust gas systems of automotive powertrains using innovative waste heat recovery devices. These systems can convert thermal energy into mechanical or electrical energy, thus increasing the overall efficiency of the vehicle. Organic Rankine cycle, thermoelectric systems, turbocompounding, and recuperative thermal management systems all have potential for significantly increase engine efficiencies.

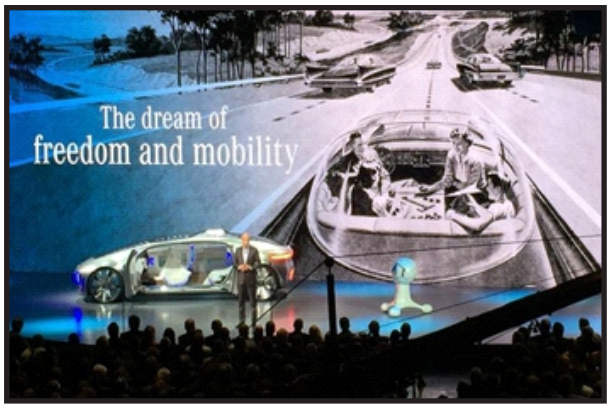
A smaller but still significant aspect of fuel-efficiency research is called "intelligent energy management." "This ability to more intelligently control the accessory loads in a vehicle—such as the alternator or power steering, etc.—will also contribute to better gas mileage," says Rizzoni. "With smarter control of these loads and the addition of stop-start technology there can be significant increases in fuel economy, with small or no increase in total vehicle cost."

DID YOU KNOW?

Adolf Hitler ordered Ferdinand Porsche to manufacture a Volkswagen, which literally means 'People's Car' in German. This car went on to become the Volkswagen Beetle.

TOP ADVANCED CAR TECHNOLOGIES BY 2020

Mercedes-Benz showed off its fully autonomous F015 Luxury in Motion concept car in Las Vegas, while Buick, Chevrolet, Hyundai, Infiniti and Volkswagen all had concepts sporting advanced features in Motown. Many of these technologies are a ways off, but others are just around the corner, or even entering showrooms right now. The rate at which technology is changing personal transportation accelerates every year, which can make predicting the arrival of future car tech a dicey proposition. Even more compelling is the increasing priority we're seeing consumers place on automotive technology during their shopping process at **Kelly Blue Book.** This had me wondering -- what automotive technologies will go from science fiction to commonplace in just the next 5 years. I've listed these below in an effort to identify the top 10 advanced car technologies we'll see in showrooms by 2020.



1. Autonomous Vehicle - Let's just get this one out of the way. Note I didn't say ***fully*** autonomous vehicle. Why? Because it will take more than 5 years before a car can drive anywhere, at all times, without human oversight. But by 2020 we'll have cars capable of being fully autonomous in certain circumstances, most likely rural interstates with minimal variables (and no inclement weather). Think early days of cruise control.

2. Driver Override Systems - This relates to autonomous technology, but it's different because it's the car actively disregarding your commands and making its own decisions. We've already got cars that will stop if you fail to apply the brakes. But by 2020 cars will apply the brakes even if the driver has the gas pedal floored. The rapid increase in sensor technology will force a shift in priority, giving the car final say -- not you.

3. Biometric Vehicle Access -- The switch we've seen in recent years from keys to keyless entry and start will be followed by a switch to key-fob-less entry and start. You'll be able to unlock and start your car without anything more than your fingerprint (or maybe your eyeball, but fingerprint readers are more likely than retina scanners). Sound a lot like the latest form of cell phone security? It should, because it's exactly the same concept.

4. Comprehensive Vehicle Tracking - Insurance companies, and some state governments, are already talking about fees based on how many miles a person drives. By 2020 insurance companies will offer a reduced rate for drivers that agree to full tracking of their behaviour. I'm hopeful this technology remains voluntary, but do I foresee a likely future where insurance companies will *require* comprehensive driver tracking? Sadly, yes.

5. Active Window Displays - Head-Up Display (HUD) technology has come a long way from the dim, washed out green digits some cars projected on their windshields 20 years ago. But as good as HUD is in 2015, by 2020 we'll see active glass capable of displaying vibrant images. Imagine a navigation system that actually highlights the next turn (as seen from your perspective, through the windshield) as you approach it.

6. Remote Vehicle Shutdown - This technology already exists, with OnStar leveraging it regularly. In recent years the telematics company has shut down hundreds of stolen cars, ending police chases quickly and with little drama (though most drivers still don't know it can be done, even drivers with OnStar...). By 2020 remote vehicle shutdown will enter the social consciousness, negatively impacting nightly news ratings everywhere.

7. Active health **Monitoring** - Ford Motor F -0.16%Company has previewed the idea of seatbelt or steering wheel sensors that track vital statistics, though the rapid development of wearable technology means most cars will just wirelessly pair with these devices (think cell phone for your body). Combine this with basic autonomous technology and you've got a car that can pull over and call paramedics when the driver has a heart attack.

8. Four-Cylinder Supercar - Ford just showed an all-new GT supercar using a twin-turbo V6. While it may rub traditional performance enthusiasts the wrong way, a lightweight V6 making over 600 horsepower will offer world-beating performance, especially if it's got a light, carbon-fiber body to pull around. By 2020 we'll see the first full-fledged, 200-plus mph supercar with a four-cylinder engine (cubic inches be damned).

9. Smart/Personalized In-Car Marketing - You're already getting Facebook, Twitter and Gmail ads based on your behavior. By 2020 the average car will be fully connected to the internet, meaning your vehicle will provide marketers with a powerful set of metrics to customize their message. Hopefully these will manifest as an opt-in feature, but get ready for personalized, location-based ads in your car's display.

DID YOU KNOW?

In the year 1916, 55 per cent of the cars in the world were Model T Ford, which is still an unbroken record.

AN INTERVIEW WITH A PIONEER

Mr. Vamshi Krishna graduated in the year 2015 from this institution and is currently working as a Development Engineer at Toyota Industries Engine India.

Why did you choose KSIT?

I was not always inclined to engineering initially I had written AIEEE which is now known as NEET but I could not get into the institution which I wanted due to various reason. Instead of taking a year off, I chose to do engineering and chose this college as it was close to my place and I had heard loads of good reviews about the college.

How was your experience in KSIT?

The faculty at KSIT were always immensely supportive, both in academics and co-curricular activities. People always thought that I was a nerd but the truth was I took part in most of the co-curricular activities held at our college and I'm not the sort of person who would ask you to study all the time but to know how to balance academics along the other things in your life.

Believe me or not even I used to bunk classes but I never felt like going out and have fun like others used to instead I would either be at the library studying or at home sleeping.

KSIT helped me widen my social network which helped me a lot in the later stage of my life. Frankly speaking KSIT is the major reason that I have job in my hand right now.

What was your final year Project?

My final year project was, the then happening "DRONES". So I choose to build a surveillance drone which could detect leaks and abnormalities in the system it was surveying.

What was your inspiration for the project?

I always had the dream of doing something impact for the society. A few weeks before I had to decide the final year project I came across an article in the news about an explosion that occurred in a village near the river Godavari. The reason behind the explosion was a leak in the gas lines running near the village. There were graphic images of partially burnt charred bodies of people, I immediately knew I had to do something and that was the inspiration for my project.

Could you explain a bit more about your project?

The project was basically a surveillance drone. It was the programmed to reciprocate between two fixed points it had multiple sensor to detect leaks which made it vigilant.

I couldn't do as much as I hoped for due to limited resources and time. This project could have been better if the sensors were replaced with absorption spectroscopes.

How was your experience doing this project?

When we set onto this journey we knew it wasn't going to be smooth and we came across loads of road blocks. There was lot of friction between the teammates, multiple ideas to execute but limited resources. An alumni of ours called Mr. Krishna Kishore helped us out a lot and guided us throughout the journey. It was frustrating initially as things were not working as planned but with the help of our department's faculties and the alumni we pulled it off. There were plenty of DIY kits available but we wanted to build ours from scratch so we had to put on lot of effort to study and research about the various topics.

I would like to take this opportunity to thank everyone who helped us in our endeavours. I would like to emphasise on the point that the college needs to build a strong alumni base to supports its future students in their journey.

Who are your role models?

My driving force was always Sir Albert Einstein. If you see my profile pictures on my social media accounts, all of them are his pictures. The reason why I like him a lot because he was an out of the box thinker, he used to contemplate about issues always till he came across breakthrough and another person who has impacted my life is our honourable Prime Minister Sri Narendra Modi. His discipline in life, his principles and nationalistic views are of great praise and I am a strong admirer of his.

What are your principles in life?

- The right attitude and character are important.
- Be true to one self.
- Being honest.
- Give your 100% dedication to work.

What are your views on the current educational system?

There is always a gap between practical and theoretical knowledge. The teachers should be well versed enough to bridge the gap between the real life scenarios and academics. If a person tells there is no relation between what he studied and what he is working on that means he is not working in the right place. There is always a relation between your area of work and academics, a person should be capable enough to link the two. Mainly you should firm understanding of the basics.

What is your message to the budding students of KSIT?

I would suggest the upcoming students to have fun as much as possible in their engineering life as there is no room available once they enter the corporate life but at the same time one should learn the art of balancing their academics and other things.

I would strongly recommend them to have a good aggregate and not have backlogs as this is the filtering factor for the companies.

In my opinion extra-curricular activities play a key role in making a student complete.

Finally I would like end on a note that "make memories and have fun while learning but know your limits or else you'll be made fun off. Go with the wind. **All the best!**"

RÉSUMÉ BUILDING

Engineering requires a strong eye for detail. You also need lots of creativity to solve complex problems. Making sure employers see you have these skills will get you the best engineering job possible.

What is a Résumé?

Résumé is a formal presentation of a job applicant's education, skills, and work experience.

Your resume is a marketing tool. It needs to demonstrate:

- That you are employable
- How you meet the job and the organisation's requirements
- That you have the right qualifications and education
- That you have the right experience and skills
- That you have the right level of professionalism for the job

Hiring managers and recruiters say they've seen more poorly written résumés cross their desks recently than ever before. Attract more interview offers and ensure your résumé doesn't eliminate you from consideration by following these three steps:

Step 1: Choose From Three Formats

Your formatting decision comes down to 3 choices: Reverse-Chronological, Functional, and Combination. Each format has their own advantages and disadvantages. Below, you will find which one is best for you.

I. Reverse-Chronological

This is the more traditional format and is what you are most likely to come across. Chronological format is flexible and can be used for applicants with any level of experience.

I should use if:

- I want to show a vertical career progression.
- I want to apply to a job in a similar field.
- I want to promote my upward career mobility

I shouldn't use if:

- I have major gaps in my employment history.
- I am changing my career path.
- I change jobs every few months.

II. Functional

While chronological places emphasis on career progression, a functional format focuses on your abilities and skills.

I should use if:

- I have gaps in my employment history.
- I am changing my career industry.
- I want to highlight a specific skill set.

I shouldn't use if:

- I want to highlight my upward career mobility.
- I am an entry level candidate that lacks experience. I lack transferable skills

III. Combination

As you can probably guess the combination format merges bits and pieces from both chronological and functional formats

I should use if:

- I want to highlight a developed skill set within a specific career.
- I want to change my career path.
- I am a master of the subject I am applying to.

I shouldn't use if:

- I want to highlight my education.
- I lack experience.
- I am an entry level candidate.

Step 2: The Order of Information

I. Contact Information

The contact information section is pretty self-explanatory. When listing your contact details you should follow this order:

- Name
- Mailing Address
- Contact Number
- Email Address (make sure it's appropriate) LinkedIn Profile

II. Choose a Résumé Introduction

Like formats, job seekers have 3 choices for their résumé introduction:

Qualifications Summary

With regards to format, the qualifications summary is a bullet point list of your most outstanding career achievements.

I should use if:

- I am applying to a job that requires a rigid set of abilities.
- I have a wealth of experience in the industry.
- I possess multiple skill sets.

I shouldn't use if:

- I lack experience.
- I am an entry level candidate that lacks specific skill sets.
- I lack measurable achievements.

Career Objective

This résumé introduction is best for entry-level candidates.

I should use if:

- I am an entry-level applicant.
- I do not have in-depth experience in the industry.
- I am a recent college graduate.

I shouldn't use if:

- I have a wealth of industry-specific skill sets.
- I am changing career paths.
- I am writing a cover letter.

Professional Profile

The professional profile is a combination of both the career objective and qualifications summary.

I should use if:

- I have had major achievement in my past experience
- I am applying to a position in the same industry
- I have a special area of expertise in my field

I shouldn't use if:

- I am an entry-level applicant
- I am recent college graduate
- I lack measurable of accomplishments

III. Professional Experience

The section is the core of your résumé, where you are tasked with proving the skills you have listed in the qualifications summary or career objective.

nowledge and expertise.

IV. Education

Having a solid education section helps to display the foundation of your knowledge and expertise.

Here are the main points to include in your education section:

- The names and location of your school, college and technical college.
- Date of graduation (month, year)
- Degree(s)
- GPA (use this format: GPA: 7.5/10.0)

V. Additional Sections

- Certifications/Licenses
- Publications
- Awards/Honors/Activities
- Technical Skills

Step 3: How to Style your Résumé?

Length of your résumé should never exceed two pages. Ideally, one page is more than enough. Yet, in India, recruiters and hiring managers often accept résumés as long as three pages.

Layout. Indian résumés are often detailed and elaborated. Compared to Western countries, in India you can get away with relatively extravagant designs. Whatever résumé design you choose, make sure your résumé remains easy to read and clearly structured.

Check out these sites if you need help with your résumé.

Enhancv (http://app.enhancv.com/)

INeedaResume (http://ineedaresu.me/#/)

DID YOU KNOW ?

British luxury car marque Aston Martin's name came from one of the founders Lionel Martin who used to race at Aston Hill near Aston Clinton.

JOURNALS - FACULTY

1. Dr. K. Rama Narsimha

Effect of suction/blowing on unsteady mhd slip flow of casson fluid over a stretching sheet with thermal radiation.

Abstract: Analysis of Unsteady Magneto hydro dynamic slip flow of Casson fluid past a vertically stretching sheet in pressure of Suction and Blowing with heat absorption and generation is carried out numerically. The resulting Partial differential equation is converted in to Ordinary differential equation using similarity conditions and these equations with boundary conditions are solved using fourth order Runge-Kutta method by applying Mat-Lab software. The resulting numerical values are plotted to study velocity and temperature profiles in order to make out changes in the boundary layer thickness by using different parameters. The digression in the velocity and temperature profiles are studied by varying the values of different governing parameters like Slip parameter, Magnetic parameter, Unsteadiness parameter, Permeability parameter, Casson parameter, Prandtle number, Radiation parameter, Heat generation and Absorption parameter and Suction/Blowing parameter. It is observed that variation in the slip parameter has a profound effect on velocity boundary layer thickness and on also on heat transfer rate in presence of Suction/Blowing. No. 2(43), pp. 483-494, **30-06-2018.**

2. Dr. B. S. Ajay Kumar

Effect of cutting speed on generation of heat at work-tool interface of copper based silver and brass alloys.

Abstract: Copper and its alloy are extensively used in various electrical and other industrial applications, due to its high thermal and electrical conductivity. The machinability of copper depends on its alloying elements and its composition. The addition of alloying element reduces machinability and hence the amount of heat generated also variable which is dependent on the composition of the alloying element and the machining parameters. The current research is an attempt to study the amount of heat generated at the work tool interface for varying cutting speeds and varying compositions of brass and silver in copper. The research reveals that the number of heat generated decreases as the amount of silver content increases in the alloy indiacting higher thermal conduvtivity. **Jun. 09, 2018**. Paper ID: IJMPERADJUN201896.

3. Mr. Umashankar .M

Vertical takeoff and landing (VTOL) aircraft using tiltrotor mechanism.

Abstract: A multi rotor is aircraft which generates lift and propulsion by way of one or more powered rotors mounted on rotating engine pods usually at the ends of a fixed wing which drive the shaft transferring power to rotor assemblies mounted on the wingtips. It combines the vertical lift capability of a helicopter with the speed and range of a conventional

fixed wing aircraft. For vertical flight, the rotors are angled so the plane of rotation is horizontal, lifting the way a helicopter rotor does. As the aircraft gains speed, the rotors are progressively tilted forward, with the plane of rotation eventually becoming vertical. In this mode the wing provides the lift, and the rotor provides thrust as a propeller.Vol.5, issue 2, issn 2349-7947, **2018.**

4. Mr. Umashankar .M

Design of conical strainer and analysis using FEA

Abstract: Strainer is a mechanical element, which is used to separate the debris particles from the following fluid to downstream equipment. The fluid flow without filtration in to downstream equipment causes damage, due to the initial and maintenance cost of downstream equipment is high, it is necessary to avoid the equipment from the failure. Generally the design, maintenance and service are done by keeping the cost as its main factor. Hence the possible methods should be adopted to avoid this type of failure. The temporary strainer is used when the debris rate is more in fluid flow. The pressure exerted into the normal temporary strainer could not withstand the fluid flow exerted to the downstream process and collect the debris properly. Hence conical strainer is the type of temporary strainer proposed for large debris collection capacity. So design is carried out to take more stiffer to collect large rate of debris and withstand more pressure with less deformation. Finally validate the results of FEA solution with the theoretical solution. From the derived formulae, the deformation is more than the expected level, obtained better result for conical strainer with stiffener. ISSN: 2319-6734, Vol. 7,Issue 2 Ver. V, pp. 61-65, **Feb. 2018.**

5. Dr. B. S. Ajay Kumar

HVOF sprayed Ni3Ti and Ni3Ti+(Cr3c2+20NiCr) coatings: Microstructure, microhardness and oxidation behaviour.

Abstract: This paper reports the development of Ni3Ti and Ni3Ti+(Cr3c2+20NiCr) coatings on AISI 420 SS and Ti alloy ASTM B265 by HVOF technique. Microstructures, microhardness and high temperature oxidation behaviour of coatings were investigated. Microstructure of coatings was dense and displayed layers depicting lamellar structure. The microhardness of coatings was significantly higher than that of substrate owing to higher density and cohesive strength between individual splats of coating materials. Cyclic oxidation studies conducted on Ni3Ti and Ni3Ti+(Cr3c2+20NiCr) coatings showed oxides scale was composed of various oxides like NiO, NiCr2O4 and Cr2O3 phases. The formation of compact and protective NiO phase in case of Ni3Ti coatings; NiO and Cr2O3 phase in Ni3Ti+(Cr3c2+20NiCr) coatings stabilised the weight gain exhibited slow oxidation rate at higher temperatures. 28) **Oct 2017.**

6. Dr. K. Rama Narasimha

Comparative investigation and operational performance characteristics of a wick assisted and axially square grooved heat pipe

Abstract: The present work reported here involves the experimental investigation and performance evaluation of wick assisted and axially square grooved heat pipes of outer diameter 8mm, inner diameter 4mm with a length of 150mm. The objective of this work is to design, fabricate and test the heat pipes with and without an axial square groove for horizontal and gravity assisted conditions. The performance of the heat pipes was measured in terms of thermal resistance and heat transfer coefficients. In the present investigation four different working fluids were chosen namely acetone, ethanol, methanol and distilled water. Experiments were conducted by varying the heat load from 2 W to 10 W for different fill charge ratios in the range of 25% to 75% of evaporator volume for wick assisted heat pipe and 8 W to 18 W for axially square grooved heat pipe. From the experiments, it was found that there is a steady increase in temperature with the increase in heat input. The overall heat transfer coefficient was found to increase with the increase heat load for wick assisted heat pipe. In case of axially square grooved heat pipe, an attempt was made to experiment the heat pipe in different orientations. The maximum heat transfer coefficient of 7000 W/m^2°C is found for Acetone at 180° orientation, 2017.

STUDENT ACHIEVEMENT


Karnataka State Council for Science and Technology

Certificate

Proportional Integral Derivative Controller on Boilers

Adithya Pai .U, Akshay, Ankush .A. Telkar, Ashray Shetty, Mr. Umashankar .M

Abstract: A proportional–integral–derivative controller (PID controller or three term controller) is a control loop feedback mechanism used in industrial control systems and a variety of other applications requiring continuously modulated control. In practical terms it automatically applies accurate and responsive correction to a control function. Boiler control is the critical process, where a small wrong action may lead to a big explosion. So, implementation of PID Controls makes it efficient. Here in this paper the results of controlling “Temperature and Flow” Parameter will be controlled using software PID in PLC have been discussed and the results have been drawn. The paper aims at controlling temperature of boiler using PID Controller and building a prototype. The proposed idea looks to integrate both of them and implement the same into Boiler Industries.

AFTER ENGINEERING

Well there are many sectors like automotive, construction, oil and natural gas, consulting firms, piping, etc where a lot of mechanical engineers work. But more or less the life of most of these engineers are same.

First thing, it depends on what exactly you want to do in future.

1. Higher Studies - If you want to pursue higher studies, again there are various options available :

a. Technical - M.tech. (GATE) or M.S. (GRE)

b. Management - MBA(CAT, MAT etc.)

2. Govt. Jobs - Again various options are there:

a. PSUs - Core companies like NTPC, HPCL etc. hire through GATE. Some organize their own exam like BEL, AAI, DMRC etc.

b. SSC-CGL - If you want to become tax officer, excise officer etc., you can appear for this exam after completion of your Graduation.

c. Officer - If you want to serve country by entering into system and you have sufficient determination and dedication to your work, this line is for you. You can appear for various exams organized by UPSC every year. For example, Civil Services exam and if you want job in your field only, you may opt for Indian Engineering Services.

Further Information about various exams:

1. GATE - A national level examination, GATE (**Graduate** Aptitude Test in Engineering) is a qualifying exam for admissions to **post-graduate** programs (e.g., ME, MTech, **direct**PhD) in Indian institutes of higher education with financial assistance provided by MHRD and other Government agencies.

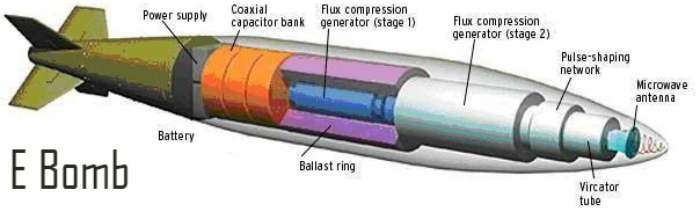
2. The GMAT - (**Graduate Management Admission Test**) is a 3½-hour **standardized** exam designed to predict how test takers will perform academically in MBA (Masters in Business Administration) programs. GMAT scores are used by **graduate** business schools to make admission decisions.

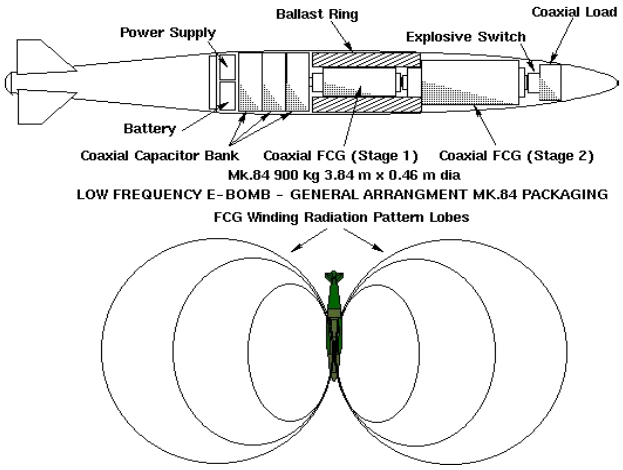
NOTE: Schools that do not require GMAT or GRE scores generally have relatively lenient admission standards and/or are located outside North America.

3. GRE/TOEFL/ITOEL – For pursuing MS in US,AUSTRALIA,GERMANY,UK. So this is no longer country specific but university specific. TOEFL is a language test and is preferred in the **US** but in most other countries including all European countries prefer IELTS. GRE is often not required outside the **US**.

NEXT EDITION

ELECTROMAGNETIC BOMB





An **e-bomb** (electromagnetic bomb) is a weapon that uses an intense electromagnetic field to create a brief pulse of energy that affects electronic circuitry without harming humans or buildings. At low levels, the pulse temporarily disables electronics systems; mid-range levels corrupt computer data. Very high levels completely destroy electronic circuitry, thus disabling any type of machine that uses electricity, including computers, radios, and ignition systems in vehicles. Although not directly lethal, an e-bomb would devastate any target that relies upon electricity: a category encompassing any potential military target and most civilian areas of the world as well. According to a CBS News report, the United States deployed an experimental e-bomb on March 24, 2003 to knock out Iraqi satellite television and disrupt the broadcast of propaganda.

In the **United States**, most e-bomb research has been carried out at the Air Force Research Laboratory at Kirtland Air Force Base in New Mexico, where researchers have been exploring the use of **high power microwaves** (HPM).

Many more new concepts...









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