

SAKTHI KUMAR ARUL PRAKASH

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EDUCATION

2013- 2014_1-year Diploma program in Product Design & Analysis.

2012 - 2016 _ Anna University, Chennai (Kumaraguru College of Technology) - **B.E. Mechatronics Engineering.**

Fall 2016 onwards - Pennsylvania State University- **M.S. Industrial Engineering.**

SOFTWARE TOOLS

Python 2.7, R Programming, C++, MATLAB, MS Office (Excel, Word.etc.) 2016, LabVIEW 2013, Arduino Programming, Pro Engineer Wildfire 5.0, Creo Parametric 2.0, CATIA V5, ANSYS 12.0 Workbench, NX CAD 7.5 & 8.0, and Hyperworks 12.0.

PUBLICATIONS

Applied for an Indian patent on, "**Design of an Alpha-Beta Double Piston Hybrid Stirling Engine**". Patent Number: **3947/CHE/2015**; complete specification filed on **August 2015**. The patented design and fabrication of the electro-mechanical hybrid Stirling engine is an optimized one, being able to come up with an experimental efficiency of **17.23%** and an increase in power output by **25%**. The experimentation and research was carried out by myself and a colleague. The work is a project turned into patent.

Applied for an Indian patent on, "**Multi-Purpose Bottle cum Snack Box**". Patent Number: **3948/CHE/2015**; complete specification filed on **August 2015**. The theme behind this patent is to maximize space utilization and to help school children reduce the burden of carrying multiple equipment for consumables.

Project titled, "**Improved accommodation and safety levels of existing Broom Stick design**". Year: **October 2016**. The existing broom stick design was studied against possible stress concentrations in the radiale, ulna and in improving existing accommodation levels based on grip diameter and stick height. A statistical model was derived and extrapolated for U.S. population, making use of 'R' Programming. The accommodation level was improved from **32%** to **62%**.

Project titled, "**Bicycle helmet re-design**". Year: **December 2016**. A critical review of the current CPSC helmet standards and current technology was made and recommendations to improve helmet design to increase fit for US population was developed using data mining concepts in 'R'. Caveats against the existing standards was found and a better method was recommended. A **97.4%** accommodation level was achieved via the new design recommendation with change in head circumference only.

Project titled, "**A mobile, diagnosis system for the identification of heart sound anomalies**". Year: **May 2017**. The project was done as part of "Data Mining Driven Design" course. Machine learning techniques were utilized in developing a model which helps understand the heart of a subject, given his heart sound. An application capable of outputting the condition of an input heart sound was developed as part of the project work. An accuracy of **89%** was achieved using "Support Vector Machines" technique.

Presented a paper at "**National Conference on mechatronics- technologies and future challenges, NCMTFC- March 2014** held in SRM University, titled, "**Energy Harvesting through Process Control and Instrumentation**". Methods to efficiently conserve energy in industries through smarter utilization of process control and instrumentation, was the theme of the paper. MEMS based stiffness springs to enable vibration isolation; based on different vibrational intensities of the machines and the conversion of the vibrational energy to electrical energy was conceptually explained.

PROFESSIONAL EXPERIENCE

I currently work as a researcher in the **Design Analysis Technology Advancement (D.A.T.A.) laboratory** in Penn State. My involvement lies in "**Facial Mining and Analysis**" and in using computer vision techniques to create remote health care applications. I am currently working on a project which helps in the detection of heart rate under varying lighting conditions and during motion using photo plethysmography signals.

Was involved in a research work titled as two phases, namely; "**Design and fabrication of Medicinal Spray Machine**" and "**Assessment of Homogeneity of Liquid Mixture Using pH and Viscometry**"- For Chicken Feed Mill from **August 2015 to April 2016**. This was an industrial project, given to us by the company, "**Optima Life Sciences. Pvt. Ltd, Pune, India**". We were to design and fabricate an optimized medicinal spray machine which was to be lighter, mixes faster and smaller in size. There was **16%** savings (in Indian Rupees) in manufacturing the machine.

Co-founder of **Ré- Research and Exploration** at **Kumaraguru College of Technology**. A start-up whose inception began on **October 2015** and emphasizes research and aids students in paper publication, projects and likes to foster research spirit in the coming generations. Tie-ups with CIBI- a government of India incubator and its operation was merged with Ré

Salem Steel Plant, Steel Authority of India Limited, Salem. A one month training on manufacture of hot and cold rolled steel, boiler and compressor house functioning and production establishments on **June 2014**. I had to analyze the safety and lifecycle of the critical components and present a detailed report on possible failures and prevention measures. I also worked on the salvaging of worn out parts in their engineering unit to re-install and save money on spare parts.