

# Luv Kumar

<https://projects.skill-lync.com/profiles/LUV-KUMAR-969>

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## Objective

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Mechanical Engineer seeking full-time opportunities with a special interest in CAE applications for meshing and simulation.

## Education

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**Master's certification program in CAE, SKILL-LYNC** (Aug 2019 - Present)

**B.E. Mechanical Engineering**, RNS Institute of Technology, Bangalore, India, CGPA- 7.8/10 (Jun 2015 - Jul 2019)

## Course Projects

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**Meshing BMW M6 and creating a wind tunnel in ANSA, Skill-Lync** (Aug 2019)

- Removed all topological errors and assigned PID to various parts.
- Surface meshed half model.
- Mesh Qualities checked on various parameters like skewness, min length, max length and aspect ratio.
- Finally created wind tunnel for flow analysis.

**Volumetric meshing of turbocharger in ANSA, Skill-Lync** (Aug 2019)

- All geometrical errors were removed and renamed PIDs.
- Generated Surface Mesh for given mesh sizes of various components.
- Before volumetric meshing, unwanted volumes were removed.

**Surface wrapping of Engine, Transmission and Gearbox assembly, Skill-Lync** (Aug 2019)

- Cleaned individual parts and wrapped in mesh mode.
- Merged three separate parts and assigned PIDs.
- Deleted intersecting faces between two parts to make it single volume.

**Hemming of Hood in ANSA, Skill-Lync** (Aug 2019)

- Mid plane of inner and outer panel were extracted using mid surface and offset commands.
- For creating hemming region, isolated inner and outer panels and projected outer panel edge on both inner and outer panel
- Thickness and PID was assigned to **HEMMING** region.
- Mesh qualities like aspect ratio, skewness, warping, trias, etc was checked.
- Tools like MV Surf, swap, paste, split reconstruct, etc were used to remove all elements failing for quality test..

**Cleaning, extracting mid surface and performing 2D mesh in Hypermesh, Skill-Lync** (Sep 2019)

- Three .hm files were imported in Hypermesh
- In all three models, errors like missing faces, overlapping faces were corrected.
- Mid surface was extracted since thickness of given model was less than 6mm.
- Finally mesh was generated with proper mesh flow along with element quality check.

**Comparing material Law using Radioss as solver and Hypermesh as Pre-Processor, Skill-Lync** (Oct 2019)

- Law1, Law2, Law27 and Law 36 were studied along with Fail Johnson card.
- Seven cases were studied and in each case energy plot and post-processing were done in Hypergraph and Hyperview.

**Analysis of Type 7 and Type 11 contact using Radioss as solver, Skill-Lync** (Oct 2019)

- Initial run was done using Type 7 contact with default properties.
- After that analysis was done using Type 7 and Type 11 contact with best recommended properties.
- For comparison energy error, mass error and simulation runtime were calculated.

**Frontal crash, side crash and roof crush analysis of Neon model using Radioss as solver** (Oct 2019)

- Contacts, boundary conditions, mass addition, engine files and control cards were created in Hypermesh.
- In post-processing, plotting of intrusion ,sectional forces on A-pillar, shotgun sectional forces, acceleration using accelerometer were done.

**Comparing behavior of 2D shell elements in Hypermesh and Radioss, Skill-Lync** (Sep 2019)

- Imported input default file and solved using Radioss solver.
- Next file with changed shell element properties was imported and solved.

- Hyper View and Hypergraph were used for simulation and plotting of graph.
- Energy error and mass error were also checked.

## **2D|3D Mesh generation in Hypermesh, Skill-Lync**

(Sep 2019)

- For generating 3D mesh, first 2D mesh was created and then under 3D option tetra was used to convert 2D to 3D mesh.
- Tetra mesh was also generated using Volume tetra.
- For generating Brick mesh, under solid mesh element offset, spin and also linear solid were used.

## **File Parsing in Python, Skill-Lync**

(Sep 2019)

- File containing engine data was analyzed.
- File was separated according to their properties and appended to different arrays.
- Separated properties was assigned into columns and rows, which can be accessed using column numbers.
- Plotted different properties like pressure vs volume.

## **Newton Raphson method to find roots of given function, Skill-Lync**

(Sep 2019)

- For doing iterations for NR method two function were defined in python program f and f prime.
- Absolute value of function was compared with tolerance value 0.0001 to do next iteration until final value was obtained
- Function values and iterations values are appended to calculate optimum relaxation factor and least iteration value.

## **Curve fitting of temperature and specific heat values in Python, Skill-Lync**

(Sep 2019)

- Imported necessary libraries for curve fit and plotting.
- Under curve\_fit library, three parameters were used. X (temp), Y ( $C_p$ ) and curve fitting polynomial function.
- R square error was calculated for both polynomials.
- From the graph it was concluded that cubic polynomial was better fit for given data.

## **Other Projects**

### **Fabrication of Button Operated Electro-Magnetic Gear Shifting System RNSIT, Bangalore**

(May 2109)

- Performed design of 3D CAD Model in SOLIDWORKS
- Assembled various parts to demonstrate Gear Change using SWITCHES.

### **Automobile Prototyping, RNSIT, Bangalore**

(June 2019)

- Learned about dynamics, control and overall design of rear view vehicles.
- Made a model car with working copies of automobile systems like transmission, suspension, powertrain, steering and the chassis.

## **Internship**

### **Vocational trainee TATA STEEL, Jamshedpur: CAD/CAM Integration and Post-Processing using MASTERCAM** (Jul 2018-Aug 2018)

- Modeling in CATIA V5
- Machining IN MASTERCAM
- Post-Processing and Generating NC code in MASTERCAM

## **Extra-curricular / Leadership Activities**

- Attended three days' workshop on Design of **CNC Plotter Machine and 3D printer** (Aug 2018)
- Attended a three days' workshop on **Heat Ventilation and Air Conditioning System (HVAC SYSTEM)** (Apr 2018)
- Runner-up in Rubik's Cube competition held in college.
- Winner of various CRICKET events held in college (BOWLER)

## **Software Packages**

- **Modelling** :SOLIDWORKS, CATIA V5
- **Computational Analysis**: ANSA, ANSYS, ACU SOLVE, HYPERMESH, RADIOSS
- **Programming**: Python, C programming