

SANGRAM ROUT- (on zoekjaar visa)

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[Portfolio](#)

Stalpaert van der Wieleweg 142612 SW-Delft-

NL

SUMMARY

Engineer with 8 years of experience in mechanical design and engineering and backed by a master's degree. On Zoekjaar (Job search visa NL)

PUBLICATIONS

Rout, S.K., Bisram, M.R. & Cao, J. Methods for numerical simulation of knit-based morphable structures: Knitmorphs. NatureSci Rep 12, 6630 (2022). <https://doi.org/10.1038/s41598-022-09422-3>

PATENTS

Systems and Methods for Dieless Composite Forming (Pending) | Application number: 18134868

FUNDING

Awarded \$1.3 Million as co-PI representing Heliogen for project High-Temperature Particle In-Line Mass Flow Sensor.

EXPERIENCE

Research Assistant Human computer interaction,

Northwestern University

Jul 2023 – Jan 2024

Evanston, IL 60201

- Developed mechanical logic gates such as AND, XOR, NOR to build half and full adder applications. Used nitinol-based springs as actuators, 3D printed parts and copper electroplated surfaces to build these units in the lab.
- Independent work: CCU reservoir and sequestration site selection from a database published by geological database (Capacity, Depth, Thickness, porosity, permeability, salinity)

Mechanical engineer

Heliogen

Aug 2021 – Apr 2023

Pasadena, CA 91103

As an engineer in a Concentrated solar plant (CSP) startup, I was the responsible engineer for the conveyance system, particle valves and overall CAD engineer for the particle receiver developed in house. In addition, I looked for opportunities to contribute to an overall system level review of the plant and data analysis

- Design responsibility of capital equipment using SolidWorks and Ansys- concentrated solar receiver, rotating type, size of 2m diameter and weighing in tones. Develop models to analyze stress, fluid and thermal performance and conducted design reviews.
- Compared PV + battery vs Heliostats + battery for report for executive team and investors.
- Developed down selection methods for conveyance systems of high temperature sand, comparing technologies such as pneumatic, belt, conveyor, and skip hoists based on efficiency, thermal loss, and costs for vertical and horizontal conveyance
- Calculated 1D thermal losses from skip hoist from radiation, convection, and conduction with inclusion of refractory and insulation.
- Design of slide gate valve for carbo ceramic bead (HSP 40/70) for operation at high temperature using Solidworks CAD tool and Ansys Finite element as tools with potential saving of \$2.0 M.
- Conducted comprehensive life cycle analysis (LCA) of 26.6 MW plant, focusing on CO2 emissions and making

recommendations for environmental impact mitigation.

- Work closely with suppliers to determine product maturity and scaling for pilot plant
- *Time series data analysis:* Data from NSTTF was analyzed using pandas and Windrose to classify annual data into direction, mean and gust. Created compelling data visualizations. Key insights derived helped in the downstream design of particle loss from receiver.
- Analyzed 5 million wind data points for downstream design of receiver to minimize particle loss. Key insights derived helped in the downstream design of particle loss from receiver.

EDUCATION

Master's in science, Northwestern University, Mechanical Engineering

Sep 2019 – Jun 2021

Bachelor's in engineering, RV College of Engineering, Mechanical Engineering

Aug 2010 – Jun 2014

Mechanical design engineer

Oct 2014 - Aug 2019

Eagle Burgmann Expansion Joints/

Denmark

Working at one of the world leading manufacturers of Expansion Joints (EJ), I worked on a wide scope of different applications and sizes of EJ optimizing for cost, weight, reliability through engineering and design.

- Responsible for full product design scope; concept, iteration, and testing of complex and large size expansion joints to high volume.
- Translating customer requirements into technical and budget needs using a variety of manufacturing processes with annual direct design impact of \$2 million through engineered system sold.
- Perform computational and hand calculated stress analyses on structures elements and complex mechanism such as Hinges, Gimbals, and Pressure balanced solutions weighing more than 10 tons
- Experience working with design code ASME VIII, EN 14917, EN 13445, EN 1092
- Optimization of design based on cost and strength subjected to 800 deg C and 200 bar along with corrosive working fluids
- High volume part design and supplier interaction. Design prototypes which were one off subjected to rigorous iterations and inhouse pressure testing on water and air
- Familiarity with design codes and standards such as ASME, ANSI, weldment, GD&T, drawings, vendor selection, revision control
- Develop new methodologies for design, create operating procedures and saved cost in coordination with cross-functional teams

Powertrain Engineer

Ashwa Racing- FSAE/Bangalore

Jan 2011 - Apr 2014

Design, build and tested a Formulas style racing car with a team of 12 engineers

- Designed an intake and exhaust system for a 600cc engine on Ricardo Wave resulting in increase of 40% more power and torque