Jousef Murad | Curriculum Vitae

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"I could either watch it happen or be a part of it."
- Elon Musk

I am a mechanical engineer in the final year of a master's degree with focus on fluid mechanics. Passionate about science, with focus on turbulence modelling, developing interpersonal skills and interest in machine learning & artificial intelligence as well as Entrepreneurship.

Foundations

- **Engineered-Mind** — **Bellheim**
  Founder — *June 2019*
  Website and YouTube channel (Jousef Murad) for engineering, programming, AI as well as psychology and self-development. **Goal: Inspire 1 million people!**

Previous Employment

- **Karlsruhe Institute of Technology - Institute for Engineering Mechanics (ITM)** — **Karlsruhe**
  Tutor — *June 2019 - Present*
  Tutor students in the fields of numerical solutions of ordinary differential equations, numerical integration of differential-algebraic system of equations (DAEs), system with distributed parameters - fluid simulation with help of the finite difference method (FDM), numerical solution procedure for partial differential equations (PDE): finite element method (FEM) as well as verification & validation
- **Karlsruhe Institute of Technology - Institute for Prod. Dev. (IPEK)** — **Karlsruhe**
  Research Assistant — *November 2018 - July 2019*
  Working on the implementation of cloud-based simulation technology (SimScale) into workshops of mechanical construction as well as doing intro lectures in front of 300+ people to show how to use simulation tools like SimScale.
- **Karlsruhe Institute of Technology - Institute for Mechanics (ITM)** — **Karlsruhe**
  Tutor — *October 2018 - December 2019*
  Responsible for more than 50 students and teach them about subjects like Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA) in the the field of **Modeling and Simulation** using MATLAB.
- **SimScale GmbH** — **Munich**
  Community & Academic Program Manager — *June 2018 - today*
  Responsible for interactions inside the forum and providing full-time support to users including problem solving for simulations in the field of FEA, CFD and Thermal Analysis. Responsible for several Formula student teams all over the world making sure they get the best support possible and providing them with knowledge if needed. On top of that I am building the community by recruiting so called Power Users inside the SimScale forum to grow our presence and make sure to keep the forum vivid.

- **Karlsruhe Institute of Technology - Institute for Process Engineering** **Karlsruhe**
  Research Assistant *May 2018 - August 2018*
  Investigating the physics of the Taylor-GreenVortex with the Lattice Boltzmann Method with strong focus on spectral methods and validation of the Kolmogorov spectrum using the tool FFTW.

- **Karlsruhe Institute of Technology - Institute for Fluid Mechanics (ISTM)** **Karlsruhe**
  Research Assistant *October 2017 - today*
  Tutor for experimental fluid mechanics. Responsible for several groups of students teaching about density based measurement techniques and experiments including **Mach-Zehnder Interferometry** as well as **Schlieren Technique**.

- **SimScale GmbH** **Munich**
  Community Manager *July 2017 - June 2018*
  Engaging users in the forum helping them with getting their simulation done in the fields of CFD, FEA, Thermal Analysis.

- **Karlsruhe Institute of Technology - Institute for Prod. Dev. (IPEK)** **Karlsruhe**
  Research Assistant *July 2017 - August 2017*
  Working on the script for the lecture Product Development - Development Method.

- **SimScale GmbH** **Munich**
  FEA Simulation Assistant *November 2016 - July 2017*
  Setting up simulations in the field of FEA & CFD. Providing full-time user support in and outside the forum as well as creating content for community building.

- **Studytutors**
  Tutor *August 2016*
  Doing webinars about mechanical design for 22 people.

- **Karlsruhe Institute of Technology - Institute for Prod. Dev. (IPEK)** **Karlsruhe**
  Tutor *June 2016 - August 2016*
  Giving tutorials about mechanical design for groups of five to six people.

- **Karlsruhe Institute of Technology - Institute of Fluid Machinery (FSM)** **Karlsruhe**
  Research Assistant *February 2016 - June 2016*
  Fluid solver code debugging with Alinea DDT.

- **APL GmbH** **Landau**
  Working Student *May 2015 - September 2015*
  Generation of real surfaces and evaluation of surface properties as well as investigation of surface parameters with the Fast-Fourier-Transform with MATLAB.

- **APL GmbH** **Landau**
  Working Student *April 2015 - May 2015*
  Data evaluation of tribological data as well as preparation and filtering of surfaces with MATLAB. CAD modelling of a V8 engine, dynamic animation for company presentations as well as rendering with Creo 3.0 & Keyshot.

- **APL GmbH** **Landau**
  Internship *October 2014 - January 2015*
  Calculation of engine components with the Finite-Element-Method. Working in the field of tribology and contact mechanics.

- **Karlsruhe Institute of Technology - Institute for Mechanics (ITM)** **Karlsruhe**
  Working Student *February 2014 - October 2014*

Investigation of material parameters for strain hardening with a dynamic-mechnical analyser with tensile tests for metal sheets and polymers.

- **APL GmbH** **Landau**
  Internship *September 2013 - October 2013*
  Basic internship in the field of basic machining methods, cutting methods, connection technology and CAD modelling with Pro-E for a self-built stirling engine.

- **Karlsruhe Institute of Technology - Institute for Prod. Dev. (IPEK)** **Karlsruhe**
  Research Assistant *February 2013 - September 2013*
  Contact simulations with Abaqus 6.12.

- **Daimler AG** **Wörth**
  Working Student *August 2011 - September 2014*
  Working at the assembly lines for the Actros and Zetros trucks of Daimler.

- **Schuler SMG GmbH & Co. KG** **Wagäusel**
  Internship *2007 & 2008*
  Learning basic knowledge of computer applications and assembling as well as disassembling of computers. Using Microsoft Office with focus on Excel and its capabilities.

Notable Projects

- **Own Project (starting soon):** *'Application of Reinforcement Learning on Gaming'*
  In this self-taught project I will apply reinforcement techniques to play a ping-pong game and maybe to apply it to other games. Other potential games: Counter-Strike 1.6, Counter Strike Source or any other Ego-Shooter. Alternatively I want to try if I am able to teach a mid hero from DotA 2 how to contest the midlane.

  : Link will follow!

- **Masters Project:** *'Linear Stability Analysis for Plane Poiseuille flow'*
  Many problems in fluid mechanics involve some aspect of flow stability, analogous to solid mechanics. The basic question is: given a basic flow state (e.g. laminar flow through a pipe) under which conditions does the flow become unstable to certain perturbations? As a first step to determine the stability of a fluid flow problem, one often supposes that the perturbations to the basic state are of very small amplitude, which allows for a linearisation of the equations. Although this is a strong assumption, linear stability analysis has proven useful in many flow configurations.

  In this assignment the stability of plane channel flow has been analyzed. The base flow was supposed to be fully-developed, pressure-driven, laminar flow directed in the x-direction (the y and z-directions are the wall- normal and spanwise coordinates, repectively). The distance between the plates is 2h. Only two-dimensional flow perturbations in the (x,y)-plane have been considered.

  : `https://github.com/jousefm/Linear-Stability-Analysis-Poiseuille`

- **Masters Project:** *'Lattice Boltzmann Method'*
  This report involved simulations for a Lid-Driven Cavity and the Kármán Vortex Street. Different code adaptions had to be made and several test cases have been carried out.

  : `https://github.com/jousefm/LBM-1`

Education

Academic Qualifications

- **Karlsruhe Institute of Technology** — **Karlsruhe**
  Master Mechanical Engineering — *April 2017 - today*
- **Karlsruhe Institute of Technology** — **Karlsruhe**
  Bachelor Mechanical Engineering — *September 2011 - April 2017*
- **Eduard-Spranger Gymnasium** — **Landau**
  High School — *2007 - 2011*
- **Grundschule Bellheim** — **Bellheim**
  Primary School — *2002 - 2007*

Thesis

Bachelor of Science with focus on "Construction and Validation of Mechanical Constructions"

Title: Investigation of the modelling of real, technical surfaces

Supervisor: Dipl.-Ing. Stefan Reichert

Description: The thesis dealt with the analysis of statistical roughness parameters of numerical generated surfaces. For this purpose, the finite element software Abaqus is used with a plugin, which makes it possible to import topographies generated with a Matlab script allowing a contact simulation between two surfaces. All the relevant parameters have been evaluated in a post-processing step. An automatic report generator has been written showing the change of the so called Abbott-Firestone curve.

Master of Science with focus on "Fluid Mechanics & Computational Mechanics"

Title: Predictive Maintenance and Explainable AI (currently working on, no fixed title yet)

Supervisor: Nadia Burkart

Description: Data driven prognostic systems enable us to send out an early warning of machine failure in order to reduce the cost of failures and maintenance and to improve the management of the maintenance schedule. For this purpose, robust prognostic algorithms such as deep neural networks are used whose put is often difficult to interpret and comprehend. We investigate these models with the aim of moving towards a transparent and understandable model which can be applied on critical applications such as within the manufacturing industry.

Courses

- **Udemy** — **Online**
  Deployment of ML Models — *currently working on*
  This 6 part course teaches how to deploy a machine learning model and which tools to use
- **DeepMind** — **Online**
  DeepMind Course — *currently working on*
  This 18 part course teaches about Deep Learning and Reinforcement Learning
- **Coursera** — **Online**
  Introduction to Tensorflow for AI, ML and DL — *currently working on*

This course from Andrew Ng and Laurence Moroney helps to build scalable AI-powered algorithms using Tensorflow

- **Coursera** **Online**
  AI for Everyone *Finished with a certificate*
  Learned about AI terminologies, state-of-the-art learning methods, how to implement AI into a company also taking into account technical, business and ethical diligence

- **Udemy** **Online**
  Machine Learning A-Z: Hands-On Python & R In Data Science *Finished with a certificate*
  Creating Machine Learning Algorithms in Python (R was neglected)

- **TU Dresden** **Karlsruhe**
  Short Course *(soon) September,12th - September, 14th 2018*
  Numerical Calculation of turbulent flows in science and practice

- **Karlsruhe Institute of Technology** **Karlsruhe**
  Spring School *March,19th - March, 23rd 2018*
  Lattice Boltzmann Methods with OpenLB Software Lab

- **Karlsruhe Institute of Technology** **Karlsruhe**
  Training Course *October 2017*
  Introduction to the computational fluid dynamics with OpenFOAM. Learn the use of existent solvers and utilities as well as the extension and modification of solvers for own simulation purposes.

- **Karlsruhe Institute of Technology** **Karlsruhe**
  CAE Workshop *Summer Semester 2016*
  Learning about the Finite Element Method, topology optimization and shape optimization using the commercial software package Abaqus.

Technical skills

Computer Languages

- **Basic:** Python, Git
- **Intermediate:** Maple
- **Advanced:** Matlab, LaTeX

Modelling & Simulation Software

- **Basic:** IcemCFD, OpenFOAM
- **Intermediate:** Ansys, Abaqus 6.12 - 6.14, Pro Engineer, Catia, Creo 2.0 & 3.0, MS Office, Tecplot
- **Advanced:** Paraview

Operating Systems

- **Basic:** -
- **Intermediate:** Linux
- **Advanced:** Unix/MacOS, Windows

Personal skills

As a student employee being in several positions I was able to gather a lot of technial experiences as well as interpersonal skills/social competences and therefore improving my soft skills.

My high degree of motivation in team works has always been appreciated by my team members. They describe me as creative, resourceful, inquisitive as well as goal oriented.

Scholarship

- **Louis Schuler Fonds:** December 2014 - July 2016
- **Louis Schuler Fonds:** April 2018 - September 2019

Ambassadorship

- **GitKraken:** July 2019 - today

Languages

- **German:** Mother tongue
- **English:** Advanced (C1 with certificate)
- **French:** Basic
- **Arabic:** Basic

Interests

- I am very passionate about gaming and am playing DotA as well as the newer part DotA 2 for more than 8 years now. Related to that I am following the progress of OpenAI and their bot competing against the best player in the world by using reinforcement learning techniques
- I am currently learning the basics of the Chinese language
- Video editing is also one of my passions, although I am not very proficient in it I am always trying to learn something new to improve the quality of my YouTube channel