**Wayne Wang**

**Local to Dallas, TX (Open to relocate to Fort Lauderdale, FL)**

**Summary**

* Trustworthy, self-motivated, ambitious, detail and goal oriented senior gear design engineer, concern for the exact correctness of work, strong commitment to tasks completed on time, take work seriously, has a strong sense of duty. With experience and knowledge in gear/gearbox/driveline/drive systems design, analysis, research & development (gears: spur, helical, crossed helical, herringbone, bevel, internal, planetary, worm, rack & pinion), gear cutting (hobbing, face hobbing, face milling, shaping, shaving & grinding). GD&T, bearings, shafts, splines, machine elements, fuel oil, cooling & lubrication systems.
* Used Autodesk Inventor, AutoCAD Mechanical, hand calculation and spreadsheet software to perform analytical verification of product designs.
* Designs, calculations & SolidWorks modelling of conventional planetary gear systems with & without internal loops under load spectrums. Designs, calculations & SolidWorks modelling of helical gears and custom involute splines, developed a spline strength calculation spreadsheet based on DIN 5466-1988. Gear reverse engineering. Gear material selection (AISI 4820 & EN 352 to replace AISI 8620), review and modification of case depth requirements based on DIN 6636.
* Design, calculation and selection of gear drive components - shafts, bolted joint (preloads, residual preloads, stress amplitude, alternating loads etc.), roller bearings. Created 3D models, conceptual and design drawings using SolidWorks.
* 10+ years of mechanical design experience, SolidWorks, Autodesk Inventor, and Solid Edge. Texas engineer in training certification, passed the professional engineer exam - machine design & materials and applying for PE license.
* Certified SolidWorks Mechanical Design - Associate. US permanent resident and German citizen, fluent in Chinese and German.

**Experience**

**Ace World Companies, Fort Worth, Texas November 2023 - September 2024**

**Principal Gear Engineer (Gearbox Engineering, KISSsoft/KISSsys, Manufacturing Support)**

* Fixture designs reducing geometric eccentrics for gear hobbing machines using GD&T and SolidWorks.
* Helical gearbox designs using KISSsoft & KISSsys. Reverse engineering for gear repair and reproduction.
* Protuberant like hob designs using KISSsoft. Gearbox failure investigation. Designs, modifications calculations of helical pinions & racks and crossed helical gears. Review and modification of gear drawings.Review and evaluation of gear measurement reports. Gear Engineering Assistance & Support to gear manufacturing: gear blanks machining, gear hobbing, gear grinding and gearbox assembly. Selection & Calculation of standard & custom keys.

# Tulsa Winch Group, Jenks, Oklahoma February 2022 - October 2023

**Mechanical Engineer III - Subject Matter Expert (Planetary Gear Designs, KISSsoft/KISSsys, Gear Engineering Assistance & Support)**

1. Designs, calculations & SolidWorks modelling of conventional planetary gear systems with & without internal loops under load spectrums. Designs, calculations & SolidWorks modelling of helical gears and custom involute splines, developed a spline strength calculation spreadsheet based on DIN 5466-1988. Gear reverse engineering. Gear material selection (AISI 4820 & EN 352 to replace AISI 8620), review and modification of case depth requirements based on DIN 6636.
2. Gear Engineering Assistance & Support to the colleagues in the US, Canada and India (review and revision of gear designs, calculations, drawings and BOMs).

# Continuing Education May 2019 - January 2022

# Passed Engineer in Training Exam and Professional Engineer Exam - Machine Design & Materials.

# PhD Qualifying Exam (Mechanical Design & Manufacturing, Solid Mechanics &Structures). Gear engineering

# & technology, mechanical design engineering.

**TATA Consultancy Services, Fort Worth, Texas July 2018 - April 2019**

1. **Contractor - Mechanical Engineer (Gear Engineering Support for the Manufacturing & Assembly of the Mining Wheel Motor Systems - Planetary Gear Systems)** 
   * + 1. 1. Design & calculation, form milling & form grinding as well as induction heat treatment of internal gears,
       2. Planetary gears with differential function. Gear and casting housing failure investigation. Spline shaft failure

investigation. Designed a device measuring half circle diameter. Casting drawing modification.

* + 1. 2. Calculated a multistage planetary gearbox under static load, calculated the gear heat generation for a gearbox
    2. lubrication system. Design of parallel key & tapered key.

3. Modified & improved planetary gear assembly instructions, bearing endplays through shim adjustment

methods, tolerance stack-up calculations for the planetary gear assemblies considering MMC/LMC/bonus,

MMB/LMB/shift, GD&T application. Redesign of double tapered roller bearing for the planetary gear shaft,

Engineering dispositions to Supplier Deviation Requests and Non-Conformance Material Reports.

**Ace World Companies, Fort Worth, Texas March 2018 - April 2018**

**Principal Gear Engineer (Gearbox Engineering, KISSsoft/KISSsys, Manufacturing Support)**

* + 1. Designed a fixture to reduce the geometric eccentricity of the gear blanks during the gear hobbing process.

Gearbox designs using KISSsoft & KISSsys. Reverse engineering for gear repair and reproduction.

* + 1. **Muncie Power Products Inc. Tulsa, Oklahoma June 2015 - March 2018**

1. **Senior Design Engineer (Gear Engineering & Manufacturing, Gearbox Design/Calculations, KISSsoft/KISSsys)**
   * + 1. 1. Designed and calculated tooth profile & lead modified spur & helical gears, standard & custom involute
          1. splines, helical compression springs, seals, clutches, interference fits & parallel keys using KISSsoft. Reverse
          2. engineering for the gear & spline design.
       2. Designed, calculated and modified/improved gearboxes including bearing & shaft calculations using KISSsys.
2. 2. Reviewed, modified and approved all the designs of gear and spline cutting tools (semi - topping & topping
   * 1. hobs, shapers, shavers, grinding wheel dressers and broaches).
     2. 3. Developed an innovative gearbox tolerance stack-up calculation program, discover & correct design errors,

optimize the gearbox design, reduce material & manufacturing cost, increase the operation reliability. Defined

geometric tolerances, apply GD&T to generate and change the engineering drawings with SolidWorks.

1. 4. Assist in gearbox failure investigation (including interference between the mating gear teeth), gear
2. manufacturing process and gear measurements & inspections. Provided guidance and support in gear design,
   * 1. calculations and KISSsoft for the colleagues.

# FLSmidth Inc. Midvale, Utah June 2013 - February 2015 (Mass Layoff)

# Project Engineer - Gearing (Development, Design and Project Management for Crusher Bevel Gearing)

1. Designed and calculated Gleason Straight, Skew, Spiral Bevel Gears & Klingelnberg Cyclopalloid Bevel Gears for Crushers Applications. Responsible for economical and practical designs, design improvements and development of standards for assigned products/projects (e.g. application of austempered ductile iron - ADI).

Responsible for engineering costs, schedule and generation of appropriate engineering and business system

# documents (bevel gear design and drawings, manufacturing, inspection & testing plans, work instructions, parts lists, manuals, etc.). Defined, reviewed and approved work of designers pertaining to assigned projects and products. Performed GD&T. Prepared product/process specifications and data. Provided product/process engineering information needed for proposals and to support customer requirements.

3. Reviewed, approved gear vendor’s Non Conformance Reports, deviation requests and final reports (material certificates, heat treatment reports: carburizing & through hardened, contact pattern testing, E, P and G testing, pitch, runout, tooth thickness, root clearance, backlash and dimensional inspection reports).

4. Supported aftermarket, quality and purchasing work by providing engineering assistance and work. Performed gear testing/inspection including testing machines calibration at gear manufacturers.

# Weir SPM, Fort Worth, Texas March 2012 - September 2012 (Mass Layoff)

# Mechanical Project Engineer (Development, Design and Calculation of New Lightweight Gear Drives)

1. 1. Investigation of gearbox housing failure (loads calculation/analysis of single stage helical gear and
2. planetary gear drive). Universal joints - Cardan shaft and bearing calculations (bearing life, equivalent
3. dynamic/static loads and critical speed). Modeling the equation driven involute spur gear in SolidWorks.
   * + 1. 2. Design and calculation of single stage, two stage herringbone gear and planetary gear drives (project

planning, development of design and calculation program for single stage, two stage herringbone gear and

planetary gear drives adopting standard and tooth profile modified spur gears and helical gears) for the

plunger pump application using MS Excel. Design, calculation and selection of gear drive components -

shafts, bolted joint (preloads, residual preloads, stress amplitude, alternating loads etc.), roller bearings.

Created 3D models, conceptual and design drawings using SolidWorks. Finite Element Analysis training.

# Ashmin LC, Conroe, Texas July 2011 - December 2011

**Development Engineer (Development, Design and Calculation of New Compact Planetary Gear Drive)**

1. Developed and designed a planetary gear drive for downhole mud motor application (project planning, developed calculation & design program for the planetary gear application using MS Excel, such as calculation of gear geometry, efficiency, pitting resistance, tooth bending strength, planet carrier, load balancing mechanism, rotor, plain bearing (hydrodynamic calculation), needle roller bearing, drive shaft, coupling, seal with compensating piston, fastener, housing, design/calculation of interference fit etc.). Interface with customers and vendors. Used Autodesk Inventor, AutoCAD Mechanical, hand calculation and spreadsheet software to perform analytical verification of product designs. Conducted design review. Generated, checked design/drawings. Created documentation through Document Change Notice procedure.

# Amarillo Gear Company, Amarillo, Texas October 2008 - June 2011

### Mechanical Engineer (Customer Support, Gear Design, Manufacturing, Assembly and Testing/Inspection)

1. Customer support (quotes, orders, technical support). Interdepartmental support - trouble shooting production problems, design and implementing new products and processes, technical product support to all areas. Tools design (e.g. holders, fixtures, lifting devices, storage devices etc.), stress calculation and analysis of tools using maximum shear stress/distortion energy theory (bending, tensile/compressive and shear stress).
2. Gear/gearbox design and modifications, responsible for design and implementation (calculation, design and selection of gearbox components, helical gear and spiral bevel gears - Gleason face milling, drive shafts and gear shafts (structural design, strength and rigidity calculation, critical speed), ball and roller bearings, elastic coupling and lubrication systems using Autodesk Inventor), performed GD&T. Checked design and drawings, created, reviewed and modified fan drive assembly work instructions.
3. Specifications, analysis, control and presentation of heat treatment (carburizing, quenching/press quenching and tempering). Operated and maintained the metallurgical laboratory, macro hardness and micro hardness testing, carbon content analysis, microstructure inspection. Performed special inspections.
4. **Sales Associate at Target Corporation, Maxtrade TX, Pep Boys, Dallas, Texas September 2007 - September 2008**
5. **(Sales of Auto Parts, All-Terrain Vehicles, Dirt Bikes, Go-Karts & Spare Parts)**

# Kupke+Wolf, Germany May 2006 - August 2007

**Project Engineer (Hydraulic Systems Design)**

1. Design & calculation of fuel oil supply/booster modules, high temperature/low temperature cooling water modules & lube oil modules for marine engines and power stations (e.g. design, calculation and selection of pressure tanks, storage tanks, heaters, coolers, pumps, fittings, filters, filtration units, measuring devices, controllers, piping systems etc.).

**School of Mechanical Engineering at the University of Hanover, Germany October 2004 - May 2006**

**Contractor - Research Assistant (Mechanical Design of Testing Devices)**

1. Developed a measurement program for the steam turbine test-bed using HP VEE software. Designed the test devices (flow measurement devices - Venturi Tubes and motion sensor device including a straight bevel gear design for the compressor, steam turbine and turbocharger test-beds using Solid Edge and Matlab/Simulink).
2. Tutor for the student laboratory (experimental investigation of operating behavior of gas turbine).

**Alfa Laval Middle Europe, Kupke+Wolf, Norddeutsche Filter Vertriebs, Germany May 2003 - September 2004**

**Contractor - Assistant Engineer (Product Design - Hydraulic Systems Design and Project Execution)**

1. Design and calculation of fuel oil and lube oil separator modules, fuel oil supply/booster modules, plate heat exchangers and fresh water generators for marine application. Reviewed/confirmed the quotes and contract documentation. Project planning, coordination and follow throughout manufacturing and delivery. Ordered the components/parts of BOM. Created the project documentation.

**Education**

* Hamburg University of Technology (TUHH), Germany ,Master of Science in Marine Mechanical Engineering and Energy Engineering
* Hamburg University of Technology (TUHH), Germany ,Bachelor of Science in Mechanical Engineering

**Publication**

W. Wang, “Simulation Process: Optimal Design of Combustible Fuel Module”, Schiff und Hafen (Ship and Harbor, International publication for shipping & marine technology), No.7, pp.72 - 74, July 2007.

W. Wang, “Auxiliary Systems: Concept and Simulation of a Daily Tank for Heavy Fuel Oil”, Schiff und Hafen (Ship and Harbor, International publication for shipping & marine technology), No.3, pp.62 - 65, March 2008.