

Xiyanan ZHOU

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EDUCATION

2017 - 2021	PhD in Mechanical Engineering	Imperial College London, UK
2009 - 2016	MSc & BEng in Automotive Engineering	Wuhan University of Technology, China (GPA 3.48 & 3.44/4.0)

WORKING EXPERIENCE

2021 - Present	Postdoc in Dept. of Mechanical and Industrial Engineering	Imperial College London, UK
2019	Mechanical Engineer in Dept. of Chemical engineering (Part time)	Imperial College London, UK
2016 - 2017	Academic Visitor in Dept. of Mechanical, Materials and Manufacturing Engineering	University of Nottingham, UK

HONORS & AWARDS

Nominated as the best PhD prize at Imperial College London	2021
Imperial College London PhD scholarship, £100k	2017-2021
Postgraduate travel award £600 by the City & Guilds College Association	2019
General fund £300 by Imperial College Trust	2019
Student Choice Award for Teaching	2018
Excellence Scholarship in WHUT, £15k	2015-2017

KEY RESEARCH

2022 - Present	Postdoc	NTNU
<ul style="list-style-type: none">Project: <u>Developing a novel stretching-based dimensionally correcting technique for high-precision aluminium U channels</u>Funded by the Norwegian Research Council, collaborated with Hydro, Benteler and SINTEF ManufacturingEstablished finite element model (FEM) for accurately predicting deformation and springback behaviors using AbaqusConducted tensile tests with DIC to study the plasticity anisotropy of extruded aluminumUncovered the dimension correcting mechanisms		
2017 - 2021	PhD student	Imperial College London
<ul style="list-style-type: none">Thesis: <u>Fundamental study on central crack mechanism and criterion in cross wedge rolling (CWR)</u>Funded by Imperial College London, supervised by Prof Jianguo Lin, FREng & Dr Jun JiangBuilt systematic scientific learning and teaching frameworkDesigned and manufactured lab scaled CWR prototypeEstablished FEM for simulating CWR process in hot steels, aluminum and plasticine using Abaqus & QForm & Deform 3D compiled by Fortran & LuaConducted tensile tests at various strain rates and temperatures (20 – 1100 ° C) to determine the viscoplasticity modelsRevealed multiscale central cracking mechanisms using SEM/EDX, EBSD and FEMDeveloped unified physics-based central cracking damage modelsProposed three methods to calibrate the material parameters in the proposed modelsParticipated in proposing and drafting two EPSRC fund applications (£1.25 M)		

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2019 - 2021 **Co-Investigator** Imperial College London

- **Royal Society-China NSF grant, £20 k**
- Project: Multi-scale modelling plastic deformation for twinning-induced plasticity steel
- Negotiated and drafted the project proposal with international PIs (UK and China)
- Managed the project by arranging meetings
- Established **multi-scale models** to describe the plastic deformation behaviours with twinning effects

2015 - 2017 **Principal Investigator** Wuhan University of Technology

- **Independent Innovation Research Fund, £5.5k**
- Project: Shredding mechanisms of retired car bodies
- Applied for, managed and completed the project independently
- Mastered the skills to transfer the industrial problems to scientific problems
- Visited the car recycling industries multiple times and over one week each time and discussed the industrial difficulties with the engineers intensively
- Simulated the retired car shredding process using Ansys LS-DYNA
- Revealed the **fracture mechanism** of steel/aluminium composites
- Analysed the **fatigue life** of shredding pins

TEACHING & SUPERVISING EXPERIENCES

2022 - Present **Co-supervisor** NTNU

Master project: **Tool structure optimisation** on a novel dimensional correcting technique for electric vehicle aluminium profiles

- Guided the student on the simulation and thesis writing

2019 - 2020 **Co-supervisor** Imperial College London

Year4 project: **Fracture mechanisms** of Mannesmann Effect in Piecing Process

- Drafted project proposal and weekly met the student for project progress

2017 - 2021 **Graduate Teaching Assistant** Imperial College London

Courses: 1. **Stress Analysis**; 2. **Finite Element Analysis and Application**; and 3. **material mechanics**

- Prepared the teaching materials; Marked the reports and exams
- Guided the students on the tasks and answered their individual questions

2019 **FEM trainer** Imperial College London

Lecture: **QForm Metal Forming Simulation Training**

- Initiated and organised the seminar independently; Prepared teaching materials
- Taught over 10 researchers (from undergraduate to Postdoc, from 20 to 75 years old) in my research group to build FEMs using QForm
- 1-1 tutored for the individual cases after the lecture

TECHNIQUES AND SKILLS

- **Experimental:** lab prototype building; tensile tests with DIC at high or room temperatures; hardness tests; SEM/EDX, EBSD; Additive manufacturing; Ultrasonic non-destructive test
- **Computational:** Abaqus, ANSYS, Matlab, Solidworks, CATIA, Pro/E and AutoCAD; Skilled in Fortran, C++ and Python; A competent user in metal forming simulation certificated by MICAS Simulations Limited
- **Languages:** Fluent in English (IELTS 7.5), Learning Norwegian (Level 1), basic in German and native in Chinese

JOURNAL APPOINTMENTS

- **Editor** of international journal of automotive manufacturing and materials
- **Reviewers** for international journal of machine tools and manufacture, and computer modelling in engineering and sciences

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CONFERENCES & INVITED TALKS

- The 25th International Conference on Material Forming, Braga, Portugal, **ESAFROM 2022**
- The 13th International Conference on Numerical Methods in Industrial Forming Processes, Portsmouth, USA, **NUMIFORM 2019**
- Smart Industry Conference, Demystifying the jargon: How to make the digitisation transition, Coventry, UK 2019
- The 12th International Conference on Technology of Plasticity, Cambridge, **ICTP 2017**
- The 1st International Conference on Modern Auto Technology and Services, Wuhan, 2016
- **Invited talk** on metal forming projects by Wuhan University of Technology (online), 2022
- **Invited talk** on metal forming projects organised by **SINTEF** and NTNU, Trondheim, Norway, 2021
- **Invited talk** on central cracking mechanism and criterion in CWR at SJTU, Shanghai, 2021
- **Invited talk** on physical investigation of central crack mechanism in CWR at **Oxford University**, 2020
- **Invited talk** on fracture mechanism of central cracking in CWR at Tsinghua University, Beijing, 2018

PUBLICATIONS

1. **Zhou X**, Shao Z, Zhang C, et al (2020) The study of central cracking mechanism and criterion in cross wedge rolling. *Int J Mach Tools Manuf* 159:.. <https://doi.org/10.1016/j.ijmachtools.2020.103647>
2. **Zhou X**, Sun C, Wang B, Jiang J (2022) Investigation and prediction of central cracking in cross wedge rolling. *Int J Adv Manuf Technol* 2022 1–15. <https://doi.org/10.1007/S00170-022-10126-1>
3. Wang W, Politis NJ, **Zhou X**, et al (2022) Solid-state hot forge bonding of aluminium-steel bimetallic gears: Deformation mechanisms, microstructure and mechanical properties. *Int J Mach Tools Manuf* 180:103930. <https://doi.org/10.1016/J.IJMACHTOOLS.2022.103930>
4. **Zhou X**, Shao Z, Pruncu CI, et al (2020) A study on central crack formation in cross wedge rolling. *J Mater Process Technol*. <https://doi.org/10.1016/j.jmatprotec.2019.116549>
5. **Zhou X**, Shao Z, Tian F, et al (2020) Microstructural effects on central crack formation in hot cross-wedge-rolled high-strength steel parts. *J Mater Sci* 55:9608–9622. <https://doi.org/10.1007/s10853-020-04677-5>
6. **Zhou X**, Jiang J, Lin J (2019) A Comparative Study on Damage Models of Central Cracks in Cross Wedge Rolling. In: 13th International Conference on Numerical Methods in Industrial Forming Processes. Portsmouth, USA
7. **Zhou X**, Welo T, Ma J, Tronvoll SA (2021) Deformation Characteristics in a Stretch-Based Dimensional Correction Method for Open, Thin-Walled Extrusions. *Met* 2021, Vol 11, Page 1786 11:1786. <https://doi.org/10.3390/MET11111786>
8. **Zhou X**, Ma J, Welo T (2022) Numerical analyses of deformation mechanisms in a novel dimensional calibration technique for thin-walled, open extrusions. In: 25th International Conference on Material Forming
9. **Zhou X**, Hu Z, Qin X, et al (2016) Study on the stress characteristic and fatigue life of the shredder pin. *Eng Fail Anal*. <https://doi.org/10.1016/j.engfailanal.2015.11.003>
10. **Zhou X**, Hu Z, Tao Y, et al (2016) Failure mechanisms and structural optimization of shredder hammer for metal scraps. *Chinese J Mech Eng (English Ed)*. <https://doi.org/10.3901/CJME.2016.0415.053>
11. **Zhou X**, Hu Z, Xiao X, Li M (2016) Research on shredding process and characteristics of multi-material plates for recycled cars. *Proc Inst Mech Eng Part B J Eng Manuf* 230:.. <https://doi.org/10.1177/0954405415598927>
12. **Zhou X**, Hu Z, Tao Y (2016) Fatigue analysis of hammer shredder pin and improvement measures. *Mach Tool Hydraul*. <https://doi.org/10.3969/j.issn.1001-3881.2016.01.011>
13. **Zhou X**, Hu Z, Guo W, Hua L (2015) Failure analysis and improving way of shredder hammers for retired car bodies. *J Plast Eng*
14. Li H, Hu Z, Chen Y, et al (2020) Modeling mechanical properties and plastic strain for hot forming-quenching AA6061 aluminum alloy parts. *Int J Light Mater Manuf*. <https://doi.org/10.1016/j.ijlmm.2019.12.004>
15. **Zhou X**, Hu Z, Hua L, Zheng G (2016) Influence of hammer head shape on the efficiency of retired car body during shredding process. In: The 1st International Conference on Modern Auto Technology and Services. Wuhan
16. Xiao X, **Zhou X**, Hu Z (2015) Study on the influence of driving angle of shredding hammers on shredding efficiently. In: The 1st International Conference on Modern Auto Technology and Services
17. Wei Q, **Zhou X**, Qin X (2015) Research and design of recycling sorting process line of retired vehicle body. *Wuhan Ligong Daxue Xuebao/Journal Wuhan Univ Technol* 37:.. <https://doi.org/10.3963/j.issn.1671-4431.2015.08.016>

OTHER ACTIVITIES

Volunteer as a scout leader in Hoeggen KFUK-KFUM-Speidere	2022
Volunteer for raising funds £50k to fight against Covid-19	2020
Organized team-built activities (e.g. visiting industries and universities such as Mini Coop production plant and Oxford University; organizing group trips or dinners)	2017-2021
Created and managed group website and workstation	2017-2021
Personal interests: Skiing, squash, dancing, boxing, travelling and cooking	