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PROFESSIONAL URL LINKS

<https://scholar.google.com/citations?user=74IbllwAAAAJ&hl=en>

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WORK EXPERIENCE / EMPLOYMENT HISTORY

Department of Agricultural Engineering, MNS University of Agriculture Multan, Pakistan

April 2019 — Present

Assistant Professor

Tsinghua University

September 2018 — April 2019

Post-Doctoral Fellow

- Advanced power cycles
- Supercritical Carbon dioxide power cycle (sCO₂) model development and design optimization
- Steady-state modeling and effects of system scale and transient requirement
- Explicit structures of sCO₂ cycle to find solutions according the high need of compact energy source solution

Dept. of Energy Systems Engineering, University of Agriculture Faisalabad, Pakistan

June 2017 — June 2018

Assistant Professor

Institute for Thermal Power Engineering, College of Energy Engineering, Zhejiang University, China

September 2013 — March 2017

PhD Scholar / Research Assistant

- Development of design methodology of Stirling engine with incorporation of advanced thermodynamic and optimization methods
- Computational Fluid Dynamic (CFD) analysis of real Stirling engine
- Heat and mass transfer mechanism with flow dynamics throughout Stirling cycle
- Optimization of various prototypes of Stirling engine

EDUCATION

Post-Doctorate

September 2018 — April 2019

Tsinghua University

Research Title: Advanced power cycles with Waste Heat Recovery applications

- Supercritical Carbon dioxide power cycle (sCO₂) model development and design optimization
- Steady-state modeling and effects of system scale and transient requirement
- Explicit structures of sCO₂ cycle to find solutions according the high need of compact

Ph.D. / Dr. Eng. (Thermal Power Engineering)

September 2013 — March 2017

Zhejiang University

Research Title: Study on functional performance of Stirling engine with simulation and optimization models

- Development of design methodology of Stirling engine with incorporation of advanced thermodynamic and optimization methods
- Computational Fluid Dynamic (CFD) analysis of real Stirling engine
- Heat and mass transfer mechanism with flow dynamics throughout Stirling cycle
- Optimization of GPU-3 prototype of Stirling engine

M.Sc. (Hons.) Farm Machinery and Power

September 2009 — June 2012

University of Agriculture Faisalabad

Research Title: Design and development of Solar Tunnel Dryer

- Design and development
- Performance evaluation
- Psychrometric analysis

B.Sc. Agricultural Engineering

September 2005 — July 2009

University of Agriculture Faisalabad

RESEARCH PUBLICATIONS

ISI Journal Publications (up to 01/2021) Cumulative IF > 50

1. **Umair Sultan***, Yangjun Zhang, Muhammad Farooq, Muhammad Imran, Alamgir Akhtar Khan, Weilin Zhuge, Tariq Amin Khan, Muhammad Hummayun Yousaf, Qasim Ali "Qualitative assessment and global mapping of supercritical CO₂ power cycle technology" *Sustainable Energy Technologies and Assessments*. 2021, 43, 100978, doi: 10.1016/j.seta.2020.100978. **IF:3.427**
2. Muhammad Arslan, Muhammad Farooq, Muhammad Naqvi, **Umair Sultan**, Zia-ur-Rehman Tahir, Saad Nawaz, Nazim Waheed, Salman Raza Naqvi, Qasim Ali, M. Suleman Tariq, Ijaz Ahmad Chaudhry, John M. Anderson, Anthony Anukam, Impact of Varying Load Conditions and Cooling Energy Comparison of a Double-Inlet Pulse Tube Refrigerator. *Processes*. 2020, 8 (3), 352; doi:10.3390/pr8030352. **IF:2.753**
3. Xihui Wang, Houtao Chen, **Umair Sultan**, Xiaoxing Zhu, Zhijie Wang, Gang Xiao X, A Brief Review of the Combustion Diagnosing Techniques for Coal-Fired Boilers of Power Plants in China, *IEEE Access* 7 (2019) 126127-126136. **IF:3.745**
4. Mingjiang Ni, Hao Peng, **Umair Sultan**, Kun Luo, Gang Xiao, A quantitative method to describe the flow characteristics of an oscillating flow in porous media, *International Journal of Heat and Mass Transfer* 119 (2018) 860-866. **IF:4.947**
5. Gang Xiao, **Umair Sultan**, Mingjiang Ni, Hao Peng, Xin Zhou, Shulin Wang, Zhongyang Luo*, Design optimization with computational fluid dynamic analysis of β -type Stirling engine *Applied Thermal Engineering* 113 (2017) 87-102. **IF:4.725**
6. Gang Xiao, Hao Peng, Haoting Fan, **Umair Sultan**, Mingjiang Ni, Characteristics of steady and oscillating flow through regenerator. *International Journal of Heat and Mass Transfer* 108 (2017) 309-321. **IF:4.947**
7. Lijun Wang, Yi Jun Jia, Sunel Kumar, Rundong Li, Rasool Bux Mahar, Mujahid Ali, Imran Nazir Unar, **Umair Sultan**, Kaleemullah Memon, Numerical Analysis on the Influential Factors of Coal Gasification Performance in Two-Stage Entrained Flow Gasifier, *Applied Thermal Engineering* 112 (2017) 1601-1611. **IF:4.725**
8. Zhongyang Luo, **Umair Sultan**, Mingjiang Ni, Hao Peng, Bingwei Shi, Gang Xiao*, Multi objective optimization for GPU3 Stirling engine by combining multi-objective algorithms. *Renewable Energy* 94 (2016) 114-125. **IF:6.274**
9. Mingjiang Ni, Tianfeng Yang, Gang Xiao, Dong Ni, Xin Zhou, Huanlei Liu, **Umair Sultan**, Jinli Chen, Zhongyang Luo, Kefa Cen, Thermodynamic Analysis of a Gas Turbine Cycle Combined with Fuel Reforming for Solar Thermal Power Generation. *Energy* 137 (2017) 20-

10. Mingjiang Ni, Bingwei Shi, Gang Xiao, Hao Peng, **Umair Sultan**, Shurong Wang, Zhongyang Luo, Kefa Cen, Improved Simple Analytical Model and experimental study of a 100W β -type Stirling engine. *Applied Energy* 169 (2016) 768-787. **IF: 8.848**
11. Anjum Munir*, **Umair Sultan** and Muhammad Iqbal. Development and performance evaluation of a locally fabricated portable solar tunnel dryer for drying of fruits, vegetables and medicinal plants. *Pak. J. Agri. Sci.*, Vol. 50(3), 493-498; 2013, ISSN(Print) 0552-9034, ISSN(Online) 2076-0906. **IF: 0.618**

PROJECTS

Research Projects and grants

- Project entitled "Local development of Micro Plot Seeder for improving efficiency of agricultural experiments" at Department of Agricultural Engineering, MNS University of Agriculture Multan, Pakistan. RD-035/20, Funded by "Endowment Fund Secretariat, UAF (UAF-US Collaboration for Strengthening of Agri. Academia)". Ongoing

RESEARCH INTERESTS/AREAS

- Energy Conservation; Energy Efficiency;
- Solar thermal energy systems and storage; Advanced Power plants;
- Stirling engine technology;
- S-CO₂ power cycle technology;
- Waste heat recovery systems (Step towards Zero waste);
- Advanced Renewable Energy technologies;
- Design, analytical modelling, integration of multi-objective optimization and hybrid power systems;
- Advanced Mechanization in Agriculture;
- Computational Fluid Dynamic (CFD) analysis

SCIENTIFIC MEMBERSHIPS

- Pakistan Engineering Council (PEC) (AGRI / 2973)
- HEC (Higher Education of Pakistan) Approved PhD Supervisor
- Pakistan Society of Agricultural Engineers (PSAE)

AWARDS

- Postdoctoral Fellowship by China Postdoc Council
- Research grant by "The International Joint Research Laboratory for Innovative Design and Manufacturing of Advanced Mechanical Systems (IDM Joint Lab)" of Tsinghua University
- Cen Kefa education foundation scholarship winner as outstanding researcher award of academic year 2015-2016 by Institute for Thermal Power Engineering, Zhejiang University, China.
- CSC PhD Scholarship, Chinese Scholarship Council (CSC), September 2013-March 2017
- 2nd position in all Pakistan Project and Poster competition in renewable energy utilization SPPC-2012