

# Qianru Wu

Materials Science and Engineering  
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## Education

Materials Science and Engineering, Penn State University, 2017.9-Present, Visiting Student, Advised by Professor T. DebRoy

Mechanical Engineering, Beijing Institute of Technology, 2014.9-Present, Master and Ph. D. Student, Advised by Professor Jiping Lu

## Research Experiences

### 1. Numerical simulation of wire arc additive manufacturing (WAAM)

The finite element method was applied to simulate the material deposition procedure in WAAM with ABAQUS software. The influence of different processing parameters (molten pool size, heat input, etc.) on the temperature distribution and stress distribution of the samples were studied. Based on the solidification map of certain alloy, the grain morphology can be predicted. Moreover, the influence of different forming paths (long scanning, shorting scanning, etc.) on the stress field was investigated.

### 2. Manufacturing process research on WAAM

Investigated the microstructure and mechanical properties of Ti-6Al-4V (TC4) samples fabricated by WAAM with different processing parameters (molten pool size, heat input, wire feeding angles, forming path, etc.). Uniform deposition can be obtained with variable wire feeding direction during wire-feed additive manufacturing. Fine microstructure and unsupported overhangs can be achieved by low heat input arc additive manufacturing.

## Publications

### Journal Articles

1. **Wu Q**, Lu J, Liu C, et al.s *Obtaining uniform deposition with variable wire feeding direction during wire-feed additive manufacturing*[J]. Materials and Manufacturing Processes, 2017: 1-6. (SCI, IF=2.274)
2. **Wu Q**, Ma Z, Chen G, et al. *Obtaining fine microstructure and unsupported overhangs by low heat input pulse arc additive manufacturing*[J]. Journal of Manufacturing Processes, 2017, 27: 198-206.

(SCI, IF=2.322)

3. **Wu Q**, Lu J, Liu C, et al. *Effect of Molten Pool Size on Microstructure and Tensile Properties of Wire Arc Additive Manufacturing of Ti-6Al-4V Alloy*[J]. Materials, 2017, 10(7): 749. (SCI, IF=2.654)
4. Shi, X., Ma, S., Liu, C., **Wu, Q.**, Lu, J., Liu, Y., & Shi, W. (2017). *Selective laser melting-wire arc additive manufacturing hybrid fabrication of Ti-6Al-4V alloy: Microstructure and mechanical properties*. Materials Science and Engineering: A, 684, 196-204. (SCI, IF=3.094)
5. Shi, X., Ma, S., Liu, C., & **Wu, Q.** (2017). *Parameter optimization for Ti-47Al-2Cr-2Nb in selective laser melting based on geometric characteristics of single scan tracks*. Optics & Laser Technology, 90, 71-79. (SCI, IF=2.109)
6. Fu, J., Gong, L., Zhang, Y., **Wu, Q.**, Shi, X., Chang, J., & Lu, J. (2017). *Microstructure and Mechanical Properties of Ti-6Al-4V Fabricated by Vertical Wire Feeding with Axisymmetric Multi-Laser Source*. Applied Sciences, 7(3), 227. (SCI, IF=1.679)

#### Conference Paper

1. **Wu Q R**, Lu J P, Chen X P, et al. *The influence of cutting parameters on residual stress distribution during turning of 20Cr2Ni4 steel*[C]/Industrial Engineering and Engineering Management (IEEM), 2016 IEEE International Conference on. IEEE, 2016: 1574-1578. (EI)

#### Scholarships and Awards

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1. PhD National Scholarship, China 2017
2. Pacemaker to Excellent Graduate Students, Beijing Institute of Technology 2017 (Top 1%)
3. First Prize of Scholarship, Beijing Institute of Technology 2016-2017 (Top 10%)
4. National Inspirational Scholarship, China 2013-2014 (Top 5%)

#### Skills & Other Information

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1. **Computer Skills:** Abaqus, Pro/Engineer, Unigraphics, AutoCAD, JACK
2. **Hobbies:** Badminton, Swimming, Painting
3. **Voluntary Service:** Organized and managed library service events for 240 primary pupils