

Hae-Sung Yoon, Ph.D.

Assistant Professor

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(as of December 2018)



Professional Biosketch

Hae-Sung Yoon is currently an Assistant Professor in the School of Aerospace and Mechanical Engineering at Korea Aerospace University (KAU). He received his B.S. in 2010, and Ph.D. in 2015 (M.S. integrated) all in Mechanical and Aerospace Engineering from Seoul National University, Korea. Since then, he has held professional positions as a Postdoctoral Fellow in BK21+ Program at Seoul National University from 2015 to 2016, and as a Research Associate in the Department of Mechanical Engineering at University of Wisconsin-Madison, USA, from 2016 to 2018. He was also an affiliate researcher at Lawrence Berkeley National Laboratory, CA, USA in 2014.

Yoon's research interests are in Hybrid/Smart Manufacturing, Sustainable Manufacturing, Ultra-precision Machining, Micro/Nano Fabrication, 3D/4D Printing, Manufacturing for Design, and Smart Materials. He has authored or co-authored in 30 journal articles in these areas. For his research accomplishments, he has been honored with the Young Researcher Award from the Institute of Advanced Machines and Design in 2015, and the Outstanding Doctoral Dissertation Award from the Department of Mechanical and Aerospace Engineering, Seoul National University in 2016. He was a Research Affiliate member of CIRP (The International Academy for Production Engineering) from 2015 to 2018.

Education

2015.08.	Ph.D., Seoul National University (M.S. integrated course)	Mechanical and Aerospace Engineering
2010.02.	B.S., Seoul National University	Mechanical and Aerospace Engineering

Appointments

2018.03.-	Assistant Professor, Korea Aerospace University, Gyeonggi-do, Korea.
2016.09.-2018.02.	Research Associate, University of Wisconsin-Madison, WI, USA
2015.09.-2016.08.	Postdoctoral Fellow, Seoul National University, Seoul, Korea
2014.05.-2014.06.	Affiliate Researcher, Lawrence Berkeley National Laboratory, CA, USA

Dissertations

Ph.D. Hybrid 3D Printing by Bridging Micro/Nano Processes (Advisor: Prof. Sung-Hoon Ahn)	Seoul National University	2015.08.
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Honors, Awards, and Recognitions

1. **Yoon, H.S.**, and Min, S., 2018, **Best Presentation Award**, "Tool contact detection using servo current in an ultra-precision machine tool," Spring annual conference of the Korean Society of Manufacturing Technology Engineers 2018, Korean Soc Manuf Technol Eng, October 5.
2. **Yoon, H.S.**, Lee, J.Y., Kim, H.S., Kim, M.S., Kim, E.S., *et al.*, 2016, **Springer Award: Most Cited Article Award, 2014 to 2015**, "A comparison of energy consumption in bulk forming, subtractive, and additive processes: Review and case study," International Journal of Precision Engineering and Manufacturing-Green Technology, Vol. 1, No. 3, pp. 261-279, 2014, Korean Soc Precision Eng, Springer, October 14.
3. **Yoon, H.S.**, 2016, **Outstanding Doctoral Dissertation Award**, Department of Mechanical and Aerospace Engineering, Seoul National University, February 26.
4. **Yoon, H.S.**, 2015, **Young Researcher Award**, Institute of Advanced Machines and Design, Seoul National University, April 24.
5. **Yoon, H.S.**, Kim, J.S., Kim, H.J., and Ahn, S.H., 2011, **Best Paper Award**, "Design parameters affecting characteristics of soft morphing actuators: Case study on SMA/PEBAX materials," Autumn annual conference of the Korean Society for Precision Engineering 2010, Korean Soc

Precision Eng, June 2.

6. **Yoon, H.S.**, 2010, *Hyundai Motor Group CEO Award*, Campus Patent Strategy Universiade, The National Academy of Engineering of Korea and Korean Intellectual Property Office, December 1.
7. Lee, G.Y., Lee, K.T., Bhandari, B., Chu, W.S., **Yoon, H.S.**, et al., 2013, *Award from the Minister of Land, Infra-structure and Transport*, The 5th Creative Design Competition for the Other 90%, Sharing and Technologies Incorporated and etc., May 24.
8. **Yoon, H.S.**, 2009, *Scholarship from Mechanical Engineering*, SNU Alumni Association.

International Journal Publications

1. **Yoon, H.S.**, Singh, E., and Min, S., 2018, "[Empirical power consumption model for rotational axes in machine tools](#)," Journal of Cleaner Production, Elsevier Science Ltd (England), Vol. 196, pp. 370-381, September (SCI(E), IF 5.651 (JCR 2017), ISSN: 0959-6526, DOI: 10.1016/j.jclepro.2018.06.028), **Top 8.7% in ENVIRONMENTAL SCIENCES**.
2. **Yoon, H.S.**, Kwon S.B., Nagaraj, A., Lee, S., and Min, S., 2018, "[Study of stress intensity factor on the anisotropic machining behavior of single crystal sapphire](#)," CIRP Annals-Manufacturing Technology, Elsevier Science BV (Netherlands), Vol. 67, Issue 1, pp. 125-128, May (SCI(E), IF 3.333 (JCR 2017), ISSN: 0007-8506, DOI: 10.1016/j.cirp.2018.04.114).
3. Lee, G.Y., Kim, M., Quan, Y.J., Kim, M.S., Kim, T.J.Y., **Yoon, H.S.**, Min, S., Kim, D.H., Mun, J.W., Oh, J.W., Choi, I.G., Kim, C.S., Chu, W.S., Yang, J., Bhandari, B., Lee, C.M., Ihn, J.B., and Ahn, S.H., 2018, "[Machine health management in smart factory: A review](#)," Journal of Mechanical Science and Technology, Korean Soc Mechanical Engineers (Korea), Vol. 32, Issue 3, pp. 987-1009, March (SCI(E), IF: 1.194 (JCR 2017), ISSN: 1738-494X, DOI: 10.1007/s12206-018-0201-1).
4. **Yoon, H.S.**, Lee, H.T., Jang, K.H., Kim, C.S., Park, H., Kim, D.W., Lee, K., Min, S., and Ahn, S.H., 2017, "[CAD/CAM for scalable nanomanufacturing: A network-based system for hybrid 3D printing](#)," Microsystems & Nanoengineering, Nature Publishing Group (England), Vol. 3, 17072, September (SCI(E), IF 5.071 (JCR 2017), ISSN: 2055-7434, DOI: 10.1038/micronano.2017.72).
5. **Yoon, H.S.**, Kim, C.S., Lee, H.T., and Ahn, S.H., 2017, "[Advanced scanning paths for focused ion beam milling](#)," Vacuum, Pergamon-Elsevier Science Ltd (England), Vol. 143, pp. 40-49, September (SCI, IF 1.530 (JCR 2016), ISSN: 0042-207X, DOI: 10.1016/j.vacuum.2017.05.023).
6. **Yoon, H.S.**, Jang, K.H., Kim, E.S., Lee, H.T., and Ahn, S.H., 2017, "[Hybrid 3D printing by bridging micro/nano processes](#)," Journal of Micromechanics and Microengineering, IOP Publishing Ltd (England), Vol. 27, No. 6, 065006, June (SCI, IF 1.794 (JCR 2016), ISSN 0960-1317, DOI: 10.1088/1361-6439/aa6758).

7. Ahn, S.H., Choi, J.O., Lee, H.T., Song, J.H., Kim, M.S., **Yoon, H.S.**, and Cha, S.W., 2017, "[Effect of laser-excited ceramic nanoparticles on hardness and porosity of dry-sprayed coating](#)," CIRP Annals-Manufacturing Technology, Elsevier Science BV (Netherlands), Vol.66, No.1, pp. 519-522, April (SCI(E), IF 2.893 (JCR 2016), ISSN: 0007-8506, DOI: 10.1016/j.cirp.2017.04.080).
8. Chu, W.S., Kim, M.S., Lee, K.T., Bhandari, B., Lee, G.Y., **Yoon, H.S.**, Kim, H.S., Park, J.I., Bilegt, E., Lee, J.Y., Song, J.H., Park, G. H., Bhandari, P., Lee, C.S., Song, C. and Ahn, S.H., 2017, "[Design and performance evaluation of Korean traditional heating system–Ondol: Case study of Nepal](#)," Energy and Buildings, Elsevier Science SA (Switzerland), Vol. 138, pp. 406-414, March (SCI(E), IF 4.067 (JCR 2016), ISSN 0378-7788, DOI: 10.1016/j.enbuild.2016.12.063), *Top 2.4% in ENGINEERING, CIVIL*.
9. **Yoon, H.S.**, Lee, H.T., Kim, E.S., and Ahn, S.H., 2017, "[Direct printing of anisotropic wetting patterns using aerodynamically focused nanoparticle \(AFN\) printing](#)," Applied Surface Science, Elsevier Science BV (Netherlands), Vol. 396, pp. 1450-1457, February (SCI, IF 3.387 (JCR 2016), ISSN: 0169-4332, DOI: 10.1016/j.apsusc.2016.11.187), *Top 5.3 % in MATERIALS SCIENCE, COATINGS & FILMS*.
10. Bilegt, E., **Yoon, H.S.**, Lee, H.T., Kim, E.S., Kim, C.S., and Ahn, S.H., 2016, "[Design and evaluation of micro-cutting tools for local planarization](#)," International Journal of Precision Engineering and Manufacturing, Korean Soc Precision Eng (Korea), Vol. 17, Issue 10, pp. 1267-1273, October (SCI(E), IF 1.497 (JCR 2016), ISSN: 2234-7593, DOI: 10.1007/s12541-016-0151-4).
11. **Yoon, H.S.**, Kim, M.S., Jang, K.H., and Ahn, S.H., 2016, "[Future perspectives of sustainable manufacturing and applications based on research databases](#)," International Journal of Precision Engineering and Manufacturing, Korean Soc Precision Eng (Korea), Vol. 17, Issue 9, pp. 1249-1263, September (SCI(E), IF 1.497 (JCR 2016), ISSN: 2234-7593, DOI: 10.1007/s12541-016-0150-5).
12. Hong, Y.S., **Yoon, H.S.**, Moon, J.S., Cho, Y.M., and Ahn, S.H., 2016, "[Tool-wear monitoring during micro-end milling using wavelet packet transform and Fisher's linear discriminant](#)," International Journal of Precision Engineering and Manufacturing, Korean Soc Precision Eng (Korea), Vol. 17, Issue 7, pp. 845-855, July (SCI(E), IF 1.497 (JCR 2016), ISSN: 2234-7593, DOI: 10.1007/s12541-016-0103-z).
13. Lee, J.Y., Shin, Y.J., Kim, M.S., Kim, E.S., **Yoon, H.S.**, Kim, S.Y., Yoon, Y.C., Ahn, S.H., and Min, S., 2016, "[A simplified machine-tool power-consumption measurement procedure and methodology for estimating total energy consumption](#)," Journal of Manufacturing Science and Engineering-Transactions of the ASME, ASME (USA), Vol. 138, Issue 5, 051004, May (SCI(E), IF. 3.480 (JCR 2016), ISSN: 1087-1357, DOI: 10.1115/1.4031713), *Top 6.9% in ENGINEERING, MECHANICAL*.
14. **Yoon, H.S.**, Kim, E.S., Kim, M.S., Lee, J.Y., Lee, G.B., and Ahn, S.H., 2015, "[Towards greener machine tools - A review on energy saving strategies and technologies](#)," Renewable &

- Sustainable Energy Reviews, Pergamon-Elsevier Science Ltd (USA), Vol. 48, pp. 870-891, August (SCI, IF 6.798 (JCR 2015), ISSN: 1364-0321, DOI: 10.1016/j.rser.2015.03.100), **Top 6.8% in ENERGY & FUELS**.
15. Ahn, S.H., **Yoon, H.S.**, Jang, K.H., Kim, E.S., Lee, H.T., Kim, C.S., Lee, G.Y., and Cha, S.W., 2015, "[Nanoscale 3D printing process using aerodynamically focused nanoparticle \(AFN\) printing, micro-machining, and focused ion beam \(FIB\)](#)," CIRP Annals-Manufacturing Technology, Elsevier Science BV (Netherlands), Vol. 64, Issue 1, pp. 523-526, April (SCI(E), IF 2.492 (JCR 2015), ISSN: 0007-8506, DOI: 10.1016/j.cirp.2015.03.007).
 16. **Yoon, H.S.**, Kim, E.S., Kim, M.S., Lee, G.B., and Ahn, S.H., 2014, "[Energy consumption of the brushing process for PCB manufacturing based on a friction model](#)," International Journal of Precision Engineering and Manufacturing, Korean Soc Precision Eng (Korea), Vol. 15, Issue 11, pp. 2265-2272, November (SCI(E), IF 1.205 (JCR 2014), ISSN: 2234-7593, DOI: 10.1007/s12541-014-0590-8).
 17. Lee, G.Y., Park, J.I., Kim, C.S., **Yoon, H.S.**, Yang, J., and Ahn, S.H., 2014, "[Aerodynamically focused nanoparticle \(AFN\) printing: Novel direct printing technique of solvent-free and inorganic nanoparticles](#)," ACS Applied Materials & Interfaces, Amer Chemical Soc (USA), Vol. 6, Issue 19, pp. 16466-16471, September (SCI, IF 6.723 (JCR 2014), ISSN: 1944-8244, DOI: 10.1021/am504304g), **Top 8.8% in MATERIALS SCIENCE, MULTIDISCIPLINARY**.
 18. **Yoon, H.S.**, Lee, J.Y., Kim, M.S., and Ahn, S.H., 2014, "[Empirical power-consumption model for material removal in three-axis milling](#)," Journal of Cleaner Production, Elsevier Science Ltd (England), Vol. 78, pp. 54-62, September (SCI(E), IF 3.844 (JCR 2014), ISSN: 0959-6526, DOI: 10.1016/j.jclepro.2014.03.061).
 19. Pham, M.Q., **Yoon, H.S.**, Khare, V., and Ahn, S.H., 2014, "[Evaluation of ionic liquids as lubricants in micro milling – process capability and sustainability](#)," Journal of Cleaner Production, Elsevier Science Ltd (England), Vol. 76, pp. 167-173, August (SCI(E), IF 3.844 (JCR 2014), ISSN: 0959-6526, DOI: 10.1016/j.jclepro.2014.04.055).
 20. **Yoon, H.S.**, Lee, J.Y., Kim, H.S., Kim, M.S., Kim, E.S., Shin, Y.J., Chu, W.S., and Ahn, S.H., 2014, "[A comparison of energy consumption in bulk forming, subtractive, and additive processes: Review and case study](#)," International Journal of Precision Engineering and Manufacturing-Green Technology, Korean Soc Precision Eng (Korea), Vol. 1, Issue 3, pp. 261-279, July (SCI(E), IF 2.545 (JCR 2015), ISSN: 2286-6206, DOI: 10.1007/s40684-014-0033-0), **Springer Award: Most Cited Article**.
 21. Moon, J.S., **Yoon, H.S.**, Lee, G.B., and Ahn, S.H., 2014, "[Effect of backstitch tool path on micro-drilling for printed circuit board](#)," Precision Engineering-Journal of the International Societies for Precision Engineering and Nanotechnology, Elsevier Science Inc (USA), Vol. 38, Issue 3, pp. 691-696, July (SCI(E), IF 1.517 (JCR 2014), ISSN: 0141-6359, DOI: 10.1016/j.precisioneng.2014.03.002).
 22. Bhandari, B., Hong, Y.S., **Yoon, H.S.**, Moon, J.S., Pham, M.Q., Lee, G.B., Huang, Y. Linke, B.S.,

- Dornfeld, D.A., and Ahn, S.H., 2014, "[Development of a micro-drilling burr-control chart for PCB drilling](#)," Precision Engineering-Journal of the International Societies for Precision Engineering and Nanotechnology, Elsevier Science Inc (USA), Vol. 38, Issue 1, pp. 221-229, January (SCI(E), IF 1.517 (JCR 2014), ISSN: 0141-6359, DOI: 10.1016/j.precisioneng.2013.07.010).
23. Kim, J.W., **Yoon, H.S.**, Lee, H.S., Lee, K.E., and Ahn, S.H., 2013, "[Defects of wave patterns from tungsten carbide/stainless steel brazed micro-end-milling for printed circuit board machining](#)," Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture, Vol. 227, Issue 11, pp. 1743-1747, November (SCI, IF 0.661 (JCR 2013), ISSN: 0954-4054, DOI: 10.1177/0954405413491242).
24. Kim, J.W., **Yoon, H.S.**, and Ahn, S.H., 2013, "[Effect of repeated insertions into a mesoscale pinhole assembly: Case of interference fit](#)," International Journal of Precision Engineering and Manufacturing, Korean Soc Precision Eng (Korea), Vol. 14, Issue 9, pp. 1651-1654, September (SCI(E), IF 1.500 (JCR 2013), ISSN: 2234-7593, DOI: 10.1007/s12541-013-0223-7).
25. **Yoon, H.S.**, Moon, J.S., Pham, M.Q., Lee, G.B., and Ahn, S.H., 2013, "[Control of machining parameters for energy and cost savings in micro-scale drilling of PCBs](#)," Journal of Cleaner Production, Elsevier Science Ltd (England), Vol. 54, pp. 41-48, September (SCI(E), IF 3.590 (JCR 2013), ISSN: 0959-6526, DOI: 10.1016/j.jclepro.2013.04.028).
26. **Yoon, H.S.**, Lee, K.T., and Ahn, S.H., 2013, "[Measurement of roof deformation caused by vehicle rollover](#)," International Journal of Automotive Technology, Korean Soc Automotive Engineers (Korea), Vol. 14, Issue 4, pp. 667-674, August (SCI(E), IF 0.821 (JCR 2013), ISSN: 1229-9138, DOI: 10.1007/s12239-013-0072-5).
27. Khare, V., Pham, M.Q., Kumari, N., **Yoon, H.S.**, Kim, C.S., Park, J.I., and Ahn, S.H., 2013, "[Graphene-ionic liquid based hybrid nanomaterials as novel lubricant for low friction and wear](#)," ACS Applied Materials & Interfaces, Amer Chemical Soc (USA), Vol. 5, Issue 10, pp. 4063-4075, April (SCI, IF 5.900 (JCR 2013), ISSN: 1944-8244, DOI: 10.1021/am302761c).
28. Kim, M.H., Kim, H.J., Kim, N.N., **Yoon, H.S.**, and Ahn, S.H., 2011, "[A rotational ablation tool for calcified atherosclerotic plaque removal](#)," Biomedical Microdevices, Springer (Netherlands), Vol. 13, Issue 6, pp. 963-971, December (SCI(E), IF 3.032 (JCR 2011), ISSN: 1387-2176, DOI: 10.1007/s10544-011-9566-y).
29. **Yoon, H.S.**, Wu, R., Lee, T.M., and Ahn, S.H., 2011, "[Geometric optimization of micro drills using Taguchi methods and response surface methodology](#)," International Journal of Precision Engineering and Manufacturing, Korean Soc Precision Eng (Korea), Vol. 12, Issue 5, pp. 871-875, October (SCI(E), IF 1.141 (JCR 2011), ISSN: 2234-7593, DOI: 10.1007/s12541-011-0116-6).
30. **Yoon, H.S.**, Lee, J.Y., Kim, M.S., Kim, E., Shin, Y.J., Kim, S.Y., Min, S. and Ahn, S.H., Article in press, "[Power consumption assessment of machine tool feed drive units](#)," International Journal of Precision Engineering and Manufacturing-Green Technology, Korean Soc Precision

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Curriculum Vitae

Eng (Korea) (SCI(E), IF 3.774 (JCR 2017), ISSN: 2286-6206), **Top 8.6% in ENGINEERING, MECHANICAL.**