

Curriculum Vitae

Yongtaek Lee



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RESEARCH INTERESTS

- Water transport through porous media
- Water and heat management of PEMFC
- Visualization of water transport
- Degradation of PEMFC by repetitive freezing
- Optimum design of air-breathing PEMFC
- Computational Analysis of PEMFC
- Heat transfer and Refrigeration

EDUCATION

- Ph. D. in Mechanical Engineering, Feb. 2009
Korea University, Seoul, Korea
Thesis : Effects of water transport and freezing on the performance characteristics of polymer electrolyte fuel cells
Advisor : Prof. Yongchan Kim
- M. S. in Mechanical Engineering, Feb. 1999
Korea University, Seoul, Korea
Thesis : Experimental study on capacity modulation of an inverter driven heat pump with various expansion devices
Advisor : Prof. Yongchan Kim
- B. S. in Mechanical Engineering, Feb. 1997
Korea University, Seoul, Korea

EMPLOYMENT

2012. 03-Present : **Assistant Professor**, Dept. Mechanical Eng., Hannam University
2009. 11-2012.02: **Postdoctoral fellow**, University of Waterloo, Advisor: Prof. Xianguo Li
2009. 3-2009. 10 : **Research professor**, Korea University
1999. 1-2004. 8 : **Engineer**, System Appliance Division, SAMSUNG Electronics

RESEARCH PROJECTS

- Study on the BOP integrated multi stack PEMFC system (2012. 06-2015. 05)
- Durability improvement of PEMFCs through microfluidic study (2009. 11-2010. 10)

PUBLICATIONS

Journals published

- Bosung Kim, **Yongtaek Lee**, Ahyoung Woo, Yongchan Kim, Effects of cathode channel size and operating conditions on the performance of air-blowing PEMFCs, *Applied Energy*, 111 (2013) 441-448. (SCI)
- **Yongtaek Lee**, Variation of Porosity and Gas Permeability of Gas Diffusion Layers under Compression, *Journal of Korea Society of Mechanical Engineers B* 37 (2013) 767-773. Aug. 2013 (Domestic)
- **Yongtaek Lee**, Porometric study on the gas diffusion layers in PEMFCs using method of standard porosimetry, *Korean J. Air-conditioning and Ref. Eng.* 25 (2013) 64-69. Feb. 2013. (Domestic)
- **Yongtaek Lee**, Bosung Kim, Yongchan Kim, Xianguo Li, Degradation of gas diffusion layers through repetitive freezing, *Applied Energy*, 88 (2011) 5111-5119. Dec. 2011, Issue 12 (SCI)
- **Yongtaek Lee**, Bosung Kim, Yongchan Kim, Xianguo Li, Effects of a microporous layer on the performance degradation of proton exchange membrane fuel cells through repetitive freezing, *Journal of Power Sources*, 196 (2011) 1940-1947. Feb. 15 2011 Issue 4 (SCI)
- **Yongtaek Lee**, Bosung Kim, Yongchan Kim, An experimental study on water transport through the membrane of a PEFC operating in the dead-end mode, *International Journal of Hydrogen Energy*, 34 (2009) 7768-7779. Sep 15. 2009 Issue 18 (SCI)
- **Yongtaek Lee**, Bosung Kim, Yongchan Kim, Effects of self-humidification on the dynamic behavior of polymer electrolyte fuel cells, *International Journal of Hydrogen Energy*, 34 (2009) 1999-2007. Feb 15. 2009 Issue 4 (SCI)
- Yonghee Jang, Chasik Park, **Yongtaek Lee**, and Yongchan Kim, Flow boiling heat transfer coefficients and pressure drops of FC-72 in small channel heat sinks, *International Journal of Refrigeration*, 31 (2008) 1033-1041. Sep 2008 (SCI)
- Jongmin Choi, Yoon-Ho Kim, **Yongtaek Lee**, Kyu-Jung Lee, Yongchan Kim, Numerical analysis on the performance of cooling plates in a PEFC, *Journal of Mechanical Science and Technology* 22 (2008) 1417-1425. Jul. 2008 (SCIE)
- **Yongtaek Lee**, Yongchan Kim, Yonghee Jang, and Jong Min Choi, Effects of external humidification on the performance of a polymer electrolyte fuel cell, *Journal of Mechanical Science and Technology* 21 (2007) 2188-2195. Dec. 2007 (SCIE)
- Chasik Park, Honghyun Cho, **Yongtaek Lee**, Yongchan Kim, Mass flow characteristics and empirical modeling of R22 and R410A flowing through electronic expansion valves, *International Journal of Refrigeration* 30 (2007) 1401-1407. Dec. 2007 (SCI)
- Jaehyuk Lee, Bosung Kim, **Yongtaek Lee**, Yongchan Kim, Numerical Study on the Cooling Characteristics of a Passive-Type PEMFC Stack, *Journal of Korea Society of Mechanical Engineers B* 34 (2010) 767-774. Aug. 2010 (Domestic)
- **Yongtaek Lee**, Bosung Kim, Yongchan Kim, Jongmin Choi, Study on the steady-state and dynamic performance of polymer electrolyte fuel cells with the changes of external and self-humidification conditions, *Journal of the Korean Electrochemical Society* 10 (2007) 196-202. Aug. 2007 (Domestic)
- **Yongtaek Lee**, Chasik Park, Jaehyeok Heo, Yongchan Kim, Performance characteristics of a polymer electrolyte fuel cell with the anodic supply mode, *Journal of Korea Society of Mechanical Engineers B* 31 (2007) 588-595. Jul. 2007 (Domestic)
- Yoon-Ho Kim, Yongtaek Lee, Kyu-Jung Lee, Yongchan Kim, Jongmin Choi, Jang Myun Ko, 연료전지 냉각판의 냉각특성에 대한 수치해석적 연구, 설비공학논문집 19권 1호 (2007)

86-93. Jan. 2007 (Domestic)

- Jaehyeok Heo, Rin Yun, **Yongtaek Lee**, Yongchan Kim, Condensation heat transfer characteristics of R-134a with wall thickness and surface roughness on stainless steel horizontal plain tubes, *Journal of Korea Society of Mechanical Engineers B* 30 (2006) 1203-1210. Dec. 2006 (Domestic)
- Yongtaek Lee, Yongchan Kim, Yoon Chul Park, Min Soo Kim, 인버터형 냉동시스템의 팽창장치 변경에 따른 성능특성, 설비공학논문집 11권 6호 (1999) 928-936. Nov. 1999. (Domestic)

Proceeding/Conference papers

- Yongtaek Lee, Saher Al Shakhshir, Xianguo Li, Structure and wettability characterization of gas diffusion layers in proton exchange membrane fuel cells, Fuel Cell 2012 Science & Technology, Apr. 11-12, Berlin, Germany.
- Saher Al Shakhshir, Yongxin Wang, Yongtaek Lee, Xianguo Li, Impact of one side hydrophobic gas diffusion layer on water removal rate and proton exchange membrane fuel cell performance, SAE 2012 World Congress & Exhibition, Apr. 24, 2012, Detroit, Michigan, USA.
- Jaehyuk Lee, Bosung Kim, Yongchan Kim, **Yongtaek Lee**, A Numerical Study on the Characteristics of Cooling and Water distribution of a passive type PEMFC Stack, *The 5th Asian Conference on Refrigeration and Air-conditioning*, June 7-9, 2010, Tokyo, Japan. Paper No. 057
- Jaehyuk Lee, Bosung Kim, **Yongtaek Lee**, Yongchan Kim, A Numerical Study on the Characteristics of Cooling of the PEMFC Stack, *KSME conference*, Nov. 4-6, 2009, Pyungchang, Korea.
- **Yongtaek Lee**, Bosung Kim, Hoon Kang, Yongchan Kim, Jong Min Choi, Effects of gas diffusion layer of the PEFC at repeated freezing conditions, The 7th JSME-KSME Thermal and Fluids Engineering Conference, 2008, Sapporo, Japan.
- Bosung Kim, **Yongtaek Lee**, Sunil Lee, Yongchan Kim, Jong Min Choi, Jang Myoun Ko, Heat management of a PEFC stack under abrupt load changes, The 7th JSME-KSME Thermal and Fluids Engineering Conference, 2008, Sapporo, Japan.
- Jaehyeok Heo, **Yongtaek Lee**, Sunil Lee, Yongchan Kim, Improvement of the heating performance in a variable speed heat pump by applying the gas injection technique into a twin rotary type compressor, International Congress of Refrigeration, 2008, Beijing, China.
- Rin Yun, **Yongtaek Lee**, Yongchan Kim, Post-dryout heat transfer characteristics and prediction method for CO₂ in horizontal minitubes, International Congress of Refrigeration, 2008, Beijing, China.
- **Yongtaek Lee**, Bosung Kim, Yongchan Kim, Jong Min Choi, Study on the steady-state and dynamic performance characteristics of a polymer electrolyte fuel cell under various cathodic humidification conditions, Fuel Cell Seminar, 2007, San Antonio, TX, USA.
- Jae Choon Kim, Jin Taek Chung, **Yongtaek Lee**, Yongchan Kim, Hyung-Seuk Oh, Flow analysis and performance evaluation of the hydrogen recirculation system for fuel cells, The 22nd International battery, hybrid and fuel cell electric vehicle symposium & exhibition, 2006, Japan.
- Y. Lee, Y. H. Jang, J. T. Chung, Y. Kim, Performance characteristics of a polymer electrolyte fuel cell with the anodic supply modes, 210th ECS Meeting, 2006, Cancun, Mexico.
- **Yongtaek Lee**, Yongchan Kim, Jae Choon Kim, Jin Taek Chung, and Inchul Hwang, Effects of Humidity on the Performance of a PEFC, The 3rd Asian Conference on Refrigeration and Air-conditioning, 2006, Gyeongju, Korea.

COURSES TAUGHT

- Heat transfer
- Air-conditioning and refrigeration
- Thermodynamics
- Fluid mechanics
- Engineering mathematics
- Creative engineering design
- Thermal environment theory of architecture

SOCIETY MEMBERSHIP

- ECS (The Electrochemical Society)
- SAREK (The society of Air-conditioning and Refrigerating Engineers of Korea)
- Korean Electrochemical Society
- ASHRAE (American Society of Heating, Refrigerating, and Air-conditioning Engineers)
- KSME (Korea Society of Mechanical Engineers)