Tibor FABIAN

Education:

Vienna University of Technology, Vienna, Austria,
PhD Electrical Engineering, May 2004
Thesis: “Tip Clearance Measurements for a Palm-size Gas Turbine”

Vienna University of Technology, Vienna, Austria,
MS Electrical Engineering,1998
Thesis: “Comparison and optimization of control algorithms for a capacitive angular- and angular-speed sensor"

Slovak Technical University, Bratislava, Slovak Republic
1990-94 (transferred to Vienna University of Technology in 1994)
Department of Electrical Engineering.

Experience:

Ardica Technologies Inc., San Francisco, USA
Founder and CTO (01/06- present)
Company aims to commercialize micro-fuel cells for consumer products.

Stanford University, Mechanical Engineering Department, Stanford, USA,
Research Associate (10/04 - present)
Research Staff (8/99 – 10/04)

Projects follow below:

Single plant cell analysis: Designed a single cell analysis station by combining atomic-force and inverted confocal microscope with a Faraday cage and an actively cooled open-channel cell localization platform. Designed custom atomic-force nozzles.

Advanced water pumping technologies for miniature hydrogen fuel cells: Invented and implemented integrated active water management system based on electro-osmotic pumping.

Laminated Planar Micro Fuel Cell: Invented and implemented process for planar fuel cell fabrication based on hybrid multi-layer printed circuit board (PCB) technology.

Miniature bi-stable valve: Developed a novel micro valve based on a bi-stable buckled beam. Designed electromagnetic actuator, bi-stable membranes, and sealing structures. Led fabrication and testing of the valve.

Micro gas-turbine generator: Invented method for axial tip clearance measurement in micro gas turbine generators based on capacitive sensor. Led design, analysis and evaluation of an axial-gap generator, as well as design and implementation of an active tip clearance control system for a micro gas turbine generator using capacitive tip-clearance sensor.

Tibor FABIAN

Differential pressure sensor: Invented PCB based manufacturing process for a differential pressure sensor. Designed and implemented functional sensor prototype.

Centimeter-size flying vehicle (Mesicopter): Conducted survey of high-power, high-energy, and low-weight energy sources. Designed vehicle frame and integrated motors and motor controllers.

Vienna University of Technology, Electrical Engineering Department, Vienna, Austria,
Research Assistant: (6/96 – 6/99)
Developed designed and tested capacitive angular sensors.

Patents:

1. F.B. Prinz, S. Kang, **T. Fabian**, J. Tresser, F. Holman, H. Tsuru, M, Matsunaga, Micro gas turbine engine with active tip clearance control, US Patent No. 6,692,222, February 17, 2004
2. **T. Fabian**, F. Holman, S. Kang, H.C. Liu, M. Matsunaga, F.B. Prinz, H. Tsuru, Miniature gas turbine engine with unitary rotor shaft for power generation. US Patent No. 6,866,478, March 15, 2005
3. J. Santiago, J. Posner, F.B. Prinz, **T. Fabian**, J. Eaton, S.W. Cha, C. Buie, D. Kim, H. Tsuru, J. Sasahara, T. Kubota, Y. Saito, Fuel cell with electroosmotic pump, US Patent Application No. 20060029851
4. D. Accoto, F. B. Prinz, **T. Fabian**, W.H. Ryu, J. Sasahara, H. Tsuru, G. Brasseur, Bistable miniature valve, US Patent Application No. 20060017534
5. J. Sasahara, D. Braithwaite, **T. Fabian**, T. Kubota, N. Kuriyama, S.J. Lee, R. O'Hayre, F.B. Prinz, Y. Saito, T. Suzuki, Fuel cell, US Patent Application, 20040224190, November 11, 2004
6. P. Krippner, S. Kang, **T. Fabian**, F.B. Prinz, W. Scholz, D. Binz, Differential pressure transducer unit, International patent application WO2006061036, June 15, 2006
7. P. Krippner, S. Kang, **T. Fabian**, F.B. Prinz, Method for producing a measuring transducer, International patent application No. WO2006061036, June 15, 2006

Reviewer for Archived Journals
Journal of New Materials for Electrochemical Systems 2007
IEEE Transactions on Instrumentation and Measurement 2007
Fuel Cells 2007

Archived Publications:

Submitted and under review:

Published

1. S.J. Bai, **T. Fabian**, F.B. Prinz, R.J. Fasching, "Nanoscale Probe System for Cell-Organelle Analysis", Sensors and Actuators B, in press

Tibor FABIAN

2. S. Litster, C. Buie, **T. Fabian**, J.K. Eaton, and J.G. Santiago, “Active water management for PEM fuel cells”, Journal of the Electrochemical Society, vol. 154, B1049, 2007
3. **T. Fabian**, R. O’Hayre, F.B. Prinz, and J.G. Santiago, “Measurements of spatial and temporal variations of temperature and reaction species in the cathode diffusion layer of a planar air-breathing PEM fuel cell”, Journal of the Electrochemical Society, volume 154, no.10, p. B910, 2007
4. R. O’Hayre, **T. Fabian**, S. Litster, F.B. Prinz, and J.G. Santiago, “Engineering Model of a Passive Planar Air Breathing Fuel Cell Cathode”, Journal of Power Sources, Volume 167, Issue 1, 1 May 2007, Pages 118-129
5. Buie, C.B., Posner, J.D., **Fabian, T.**, Cha, S.W., Kim, D., Prinz, F.B., Eaton, J.K., and Santiago, J.G., “Water Management in Proton Exchange Membrane Fuel Cells using Integrated Electroosmotic Pumping,” Journal of Power Sources, Volume 161, (2006), 191-202
6. **T. Fabian**, J.D. Posner, R. O'Hayre, S.-W. Cha, J.K. Eaton, F.B. Prinz and J.G. Santiago,"The role of ambient conditions on the performance of a planar, air-breathing hydrogen PEM fuel cell", Journal of Power Sources, Volume 161, Issue 1, 20 October 2006, Pages 168-182
7. R. Fasching, S.-J. Bai, **T. Fabian**, F. Prinz, Nanoscale Electrochemical Probes for Single Cell Analysis. Microelectronic Engineering, Volume 83, Issue 4-9, April-September 2006, Pages 1638-1641
8. **T. Fabian**, G. Brasseur, F. Prinz, ”Capacitive sensor for active tip clearance control in a palm-sized gas turbine generator”, Instrumentation and Measurement, IEEE Transactions on , Volume 54, Issue 3, June 2005. Pages: 1133-1143
9. R. O'Hayre; D. Braithwaite, W. Hermann, S.J. Lee, **T. Fabian**, S.W. Cha, Y. Saito, F.B. Prinz, Development of portable fuel cell arrays with printed circuit technology, Journal of Power Sources; Nov 24 2003; v.124, no.2, p.459-472
10. R. O'Hayre, **T. Fabian**, S.J. Lee, F.B. Prinz, Lateral ionic conduction in planar array fuel cells, Journal of the Electrochemical Society; April 2003; v.150, no.4, p.A430-A43
11. **T. Fabian**, G. Brasseur, A robust capacitive angular speed sensor, Instrumentation and Measurement, IEEE Transactions on, Volume: 47, Issue: 1, Feb. 1998, Pages: 280 – 284
12. **T. Fabian**, G. Brasseur, A measurement algorithm for capacitive speed encoder with a modified front-end topology, Instrumentation and Measurement, IEEE Transactions on, Volume: 47, Issue: 5, Oct. 1998, Pages: 1341 – 1345

Refereed conference proceedings and talks

1. **T. Fabian**, R. O'Hayre, F. Prinz and J.G. Santiago, “Spatial and Temporal Measurements of Temperature and Reaction Species in the Cathode Diffusion Layer of a Planar Air-Breathing PEM Fuel Cell”, Symposium on Proton Exchange Membrane Fuel Cells, 212th Meeting of the Electrochemical Society, Washington DC, October 7-12, 2007

Tibor FABIAN

2. S. Kesner, J.S. Plante, P. Boston, **T. Fabian**, S. Dubowsky, Mobility and Power Feasibility of a Microbot Team System for Extraterrestrial Cave Exploration, 2007 IEEE International Conference on Robotics and Automation, 10-14 April, 2007, Rome, Italy, 2007

3. **Fabian T.**, O'Hayre R., Litster S., Prinz F, and Santiago J.G., "Water Management at the Cathode of a Planar Air-Breathing Fuel Cell with an Electroosmotic Pump", Symposium on Proton Exchange Membrane Fuel Cells, 210th Meeting of The Electrochemical Society, 2006 Joint International Meeting, Cancun, Mexico, 2006.

4. O'Hayre, R., **T. Fabian**, S. Litster, F. Prinz and J.G. Santiago, "Combined Heat and Mass Transfer Model of a Passive Air Breathing Fuel Cell Cathode," Symposium on Proton Exchange Membrane Fuel Cells, 210th Meeting of The Electrochemical Society, 2006 Joint International Meeting, Cancun, Mexico, 2006.

5. O'Hayre, R., **T. Fabian**, S. Litster, F. Prinz, J.G. Santiago, "Passive Air Breathing Fuel Cells For Portable Applications: What are the Limits to Cathode Performance?" Fall Meeting of the Materials Research Society, Portable Power Symposium, Boston, MA, 2006.

6. Cha S.W., **Fabian T.**, Posner J. Prinz F.B., Buie C.,Eaton J.K., Kim D.J., Santiago J. G., “Direct water removal in gas diffusion layer of proton exchange membrane fuel cells by a flexible electroosmotic pump”, Proceedings of 4th International ASME Conference on Fuel Cell Science, Engineering and Technology, Fuelcell 2006, v.2006

7. **Fabian T.**, Posner J.D, O'Hayre R, Cha S.W, Eaton JK, Prinz F.B, Santiago J.G, "The role of ambient conditions on the performance of a planar, air-breathing fuel cell", proceedings of Small Fuel Cells 2006 -Small fuel cells for portable applications, April 2 - 4, 2006, Washington, DC USA

8. Bai S-J., **Fabian T.**, Prinz F.B., Fasching R., Nanoscale Probe System for Cell-Organelle Analysis, Abstracts of Internal Meeting on Chemical Sensors, IMCS11, 16th-19 th July 2006, Brescia, Italy.

9. Fasching R., Bai S.-J., **Fabian T.**, Prinz F., Nanofabrication of Electrochemical Probes for Single Cell Analysis, Photonics West 2006: MOEMS,MEMS, Micro and Nanofabrication, SPIE Proc. Vol. 6109, Micromachining and Microfabrication Process Technology XI, San Jose, CA, 21.-26 January (2006).

10. Buie, C.B., Posner, J.D., **Fabian, T.**, Cha, S.W., Prinz, F.B., Eaton, J.K. and J.G. Santiago, “Active Water Management for Proton Exchange Membrane Fuel Cells Using an Integrated Electroosmotic Pump,” published in the Proceedings of the International Mechanical Engineering Conference and Exposition, Orlando, FL, IMECE2005-79728, November 5-11, 2005.

11. C.R. Buie, J. Posner, **T. Fabian**, S.-W. Cha, D. Kim, F.B. Prinz, J. Eaton, and J.G. Santiago, Water Removal from Proton Exchange Membrane Fuel Cells via Electroosmotic Pumping, ECS Trans. 1, (6) 439 (2006)

12. Litster S, Buie CR, **Fabian T**, Posner JD, and Santiago JG, Water Management in a 25 cm^2 PEM Fuel Cell with Electroosmotic Pumping, Proceedings of the AIChE Annual Meeting; November 12-17, 2006; San Francisco, CA. 2006

13. Fasching R., Bai S.-J., **Fabian T.**, Prinz F., Nanoscale Electrochemical Probes for Single Cell Analysis, MNE 2005, the 31st International Conference on Micro- and Nano Engineering, Vienna, Austria, September 19.-22., 2005

Tibor FABIAN

14. **Fabian, T.**; Sangkyun Kang; Prinz, F., Capacitive blade tip clearance measurements for a micro gas turbine, Instrumentation and Measurement Technology Conference, 2002. IMTC/2002. Proceedings of the 19th IEEE, Volume: 2, 21-23 May 2002, Pages: 1011 - 1015 vol.2

15. **Fabian, T.**; Brasseur, G.; Hauser, H., Impact of axial and radial rotor offset on the measurement error of a capacitive angular-position sensor with modified front-end topology,; Instrumentation and Measurement Technology Conference, 1999. IMTC/99. Proceedings of the 16th IEEE, Volume: 3, 24-26 May 1999, Pages: 1362 – 1366, vol.3

16. **Fabian, T.**; Brasseur, G., A measurement algorithm for capacitive speed encoder with a modified front-end topology, Instrumentation and Measurement Technology Conference, 1998. IMTC/98. Conference Proceedings. IEEE, Volume: 2, 18-21 May 1998, Pages: 986 – 991, vol.2

17. **Fabian, T.**; Brasseur, G., A robust capacitive angular speed sensor, Instrumentation and Measurement Technology Conference, 1997. IMTC/97. Proceedings. 'Sensing, Processing, Networking', IEEE, Volume: 2, 19-21 May 1997, Pages: 1267 - 1272 vol.2