Tayfun Aytaç

TÜBİTAK-UEKAE-İLTAREN
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Education

Ph.D. in Electrical Engineering, Bilkent University, December 2006

M.S. in Electrical Engineering, Bilkent University, August 2002

B.S. in Electrical Engineering, Gazi University, June 2000

High School, Ankara Anatolian High School (German), June 1995

Research Interests

Infrared sensing, intelligent sensing, target differentiation and localization, target tracking, pattern recognition, inertial navigation systems/sensors, multi-sensor data fusion, and sensory signal processing

Professional Experience

Research Scientist **İLTAREN Research Group**
TÜBİTAK-UEKAE **November 2006 – ...**
• see web site of İLTAREN for further info (www.iltaren.tubitak.gov.tr)

Senior Systems Engineer **Simulation Systems Division**
Havelsan Inc. **July 2005 – September 2006**
• work interests include inertial navigation sensors, simulation of embedded GPS inertial navigation system, Kalman filtering, infrared sensing, and target tracking

Research and Teaching Assistant **Department of Electrical Engineering**
Bilkent University **September 2000 – June 2005**
• developed and implemented novel target differentiation and localization methods using infrared sensors
• assisted courses include Circuit Theory, Robotics and Sensing, Introduction to Probability, Introduction to Electrical Engineering, Random Processes, and Digital Electronics

Intern **Microwave and System Technologies**
Aselsan (Military Electronics Industry) Inc. **July 1999**
• oversaw the product department, worked in testing of circuits, soldering, and fault detection and used network analyzer

Intern **Maintenance Department**
Maksam (Machinary Industry) Inc. **July 1998**
• oversaw electrical machines, motor driver circuits, and power compensation systems

Relevant Courses Taken

Pattern Recognition, Computer Vision, Neural Networks, Digital Image Processing, Digital Coding of Waveforms, Linear System Theory, Sampled-Data Control, Medical Imaging, Biomedical Signals and Instrumentation, Telecommunications Electronics, Communication Network Analysis, Robotics and Sensing, Digital Signal Processing, Advanced Signal Processing, Random Processes, Nonlinear Systems Analysis, Optics, Photonics, Numerical Analysis

Honors and Awards

• full scholarship awarded by Bilkent University for M.S. and Ph.D. Studies, September 2000 – December 2006.
• had the second highest CGPA in the Class of 2000, Department of Electrical Engineering, Gazi

University.
• German Language Certificate Level 2 issued by the German Standing Conference of Ministers of Education and Cultural Affairs, June 1995

Professional Affiliations and Activities

Memberships
• member of the IEEE since September 2000.
• member of the Advisory Board, Department of Electrical Engineering, Gazi University since 2003.

Reviewer
• reviewer for the 13th European Signal Processing Conference, September 4–8, 2005, Antalya,Turkey.
• reviewer for the IEEE International Conference on Mechatronics, June 3–5, 2004, Istanbul,Turkey.

Other Experiences

Languages
• Turkish (native)
• fluent English and German

Computer Skills
MATLAB, C, Fortran, Motorola X6800 Assembly, PIC programming, P/SPICE, and LaTeX; UNIX and MS Windows Applications

Personal Information

• Citizenship: Citizen of the Republic of Turkey
• Date/Place of birth: January 18, 1977/Ankara, Turkey

Scholarly Publications

Articles in Refereed Journals (SCI)

[1] B. Barshan, **T. Aytaç**, and Ç. Yüzbaşıoğlu, "Target differentiation with simple infrared sensors using statistical pattern recognition techniques," accepted for publication in **Pattern Recognition** January 2007.

[2] **T. Aytaç** and B. Barshan, "Surface differentiation by parametric modeling of infrared intensity scans," **Optical Engineering**, vol. 44, no. 6, pp. 1–9, June 2005.

[3] **T. Aytaç** and B. Barshan, "Simultaneous extraction of geometry and surface properties of targets using simple infrared sensors," **Optical Engineering**, vol. 43, no. 10, pp. 2437–2447, October 2004.

[4] B. Barshan and **T. Aytaç**, "Position-invariant surface recognition and localization using infrared sensors," **Optical Engineering**, vol. 42, no. 12, pp. 3589–3594, December 2003.

[5] **T. Aytaç** and B. Barshan, "Rule-based target differentiation and position estimation based on infrared intensity measurements," **Optical Engineering**, vol. 42, no. 6, pp. 1766–1771, June 2003.

[6] **T. Aytaç** and B. Barshan, "Differentiation and localization of targets using infrared sensors," **Optics Communications**, vol. 210, no. 1-2, pp. 25–35, September 2002.

Refereed Conference Papers in English (* presented)

[7]* **T. Aytaç**, Ç. Yüzbaşıoğlu, and B. Barshan, "Statistical pattern recognition techniques for target differentiation using infrared sensor," Proceedings of the IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems, pp. 468-473, Heidelberg, Germany, September 2006.

[8]* **T. Aytaç** and B. Barshan, "Extraction of target features using infrared intensity signals," Proceedings of the 12th European Signal Processing Conference, September 2005, Antalya, Turkey.

[9]* **T. Aytaç** and B. Barshan, "Surface differentiation and localization by parametric modeling of infrared intensity scans," Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 2294–2299, August 2005, Edmonton, Alberta, Canada.

[10] **T. Aytaç** and B. Barshan, "Surface recognition by parametric modeling of infrared intensity signals," Proceedings of the 12th European Signal Processing Conference, pp. 1107–1110, September 2004, Vienna, Austria.

[11]* **T. Aytaç** and B. Barshan, "Position-invariant surface recognition and localization with simple infrared sensors for robotics applications," Proceedings of the FIRA Robot World Congress, CD-ROM, October 2003, Vienna, Austria.

[12]* **T. Aytaç** and B. Barshan, "Differentiation and localization of target primitives using infrared sensors," Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 105–110, September/October 2002, Lausanne, Switzerland.

[13]* **T. Aytaç** and B. Barshan, "Rule-based target differentiation and position estimation for indoor mobile robotics applications," Proceedings of the 6th International Conference on Mechatronic Design and Modeling, pp. 57–68, September 2002, Cappadocia, Nevşehir, Turkey.

[14] **T. Aytaç** and B. Barshan, "Target differentiation and localization using infrared sensors," Proceedings of the 19th Congress of the International Commission for Optics: Optics for the Quality of Life, G. C. Righnini, A. Consortini, eds., vol. 4829, pp. 889–890, pub. date: November 2003, conf. date: August 2002, Florence, Italy.

Refereed Conference Papers in Turkish (* presented)

[15]* **T. Aytaç** and B. Barshan, "Kızılberisi algılayıcılarla yapay sinir ağlarına dayalı hedef ayırdetme," Proceedings of the Automatic Control National Meeting, in Turkish, pp. 202-207, November 2006, Ankara, Turkey.

[16] **T. Aytaç**, Ç. Yüzbaşıoğlu, and B. Barshan, "Istatistiksel örüntü tanıma teknikleri kullanarak kızılberisi algılayıcılarla hedef ayırdetme," Proceedings of the 14th IEEE Conference on Signal Processing, Communications and Applications, in Turkish, pp. 1–4, April 2006, Antalya, Turkey.

[17]* **T. Aytaç** and B. Barshan, "Kızılberisi yeğinlik sinyalleri kullanılarak hedeflerin geometrik ve yüzey özelliklerinin eşzamanlı olarak çıkarımı," Proceedings of the 13th IEEE Conference on Signal Processing, Communications and Applications, in Turkish, pp. 522–525 May 2005, Kayseri, Turkey.

[18]* **T. Aytaç** and B. Barshan, "Kızılberisi algılayıcılardan elde edilen sinyallerin parametrik modellenmesiyle yüzey ayırdetme ve konum kestirimi," Proceedings of the 12th IEEE Conference on Signal Processing, Communications and Applications, in Turkish, pp. 253–256, April 2004, Kuşadası, Aydın, Turkey.

[19]* **T. Aytaç** and B. Barshan, "Kızılötesi yeğinlik ölçümleriyle kurala dayalı hedef ayırdetme ve konum kestirimi," Proceedings of the 11th IEEE Conference on Signal Processing, Communications and Applications, in Turkish, pp. 464–467, June 2003, İstanbul, Turkey.

[20]* **T. Aytaç** and B. Barshan, "Kızılötesi algılayıcılarla pozisyondan bağımsız yüzey tanıma ve konumlandırma," Proceedings of the Automatic Control National Meeting, in Turkish, pp. 115–124, September 2002, Ankara, Turkey.

[21]* **T. Aytaç** and B. Barshan, "Kızılötesi algılayıcılardan elde edilen sinyallerle hedef ayırdetme ve konum kestirimi," Proceedings of the 10th IEEE Conference on Signal Processing, Communications and Applications, in Turkish, vol. 2, pp. 955–960, June 2002, Pamukkale, Denizli, Turkey.

Scholarly Work in Progress

[22] **T. Aytaç** and B. Barshan, "Neural network-based target differentiation using infrared sensors," to be submitted, 2007.

PhD Dissertation

[23] "A comparative analysis of different approaches to target differentiation and localization using infrared sensors," December 2006, Bilkent University, Turkey
Supervisor: Prof. Billur Barshan

MSc Thesis

[24] "Differentiation and localization using infrared sensors," August 2002, Bilkent University, Turkey
Supervisor: Prof. Billur Barshan

SCIENTIFIC CITATIONS

There are 23 citations (11 from other researchers and 12 self-citations) in SCI publications as of November 2006.

MAGAZINE CITATIONS

• our work on surface recognition with simple infrared sensors was the subject of a news article published in Laser Focus World (SCI), the leading trade magazine of the laser science industry:

John Wallace, "Simple sensor characterizes surfaces," Laser Focus World, vol. 40, issue 3, p. 38, 2p, 1bw, March 2004.

REFERENCES

available upon request.