

Anna Gruebler

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Education

2010-2013. Ph. D. in Engineering.

Artificial Intelligence Laboratory, University of Tsukuba, Japan.

Thesis Title: A Study on Facial Expression Reading for Describing and Augmenting Interaction using a Wearable Interface (The thesis defense was on January 29th 2013)

Supervisors: Dr. Kenji Suzuki, Dr. Takehisa Onisawa and Dr. Junichi Hoshino

Brief Synopsis of Research:

Facial expressions play a significant role in interpersonal information exchange. I created an unobtrusive emotion reading system that can recognize people's facial expressions in real-time and displays the output in different formats by processing facial EMG signals acquired from the side of the face and combining Independent Component Analysis and an Artificial Neural Network. Applications lie in: quantitative smile evaluation during therapeutic activities, aid the visually impaired, distance communication and computer games, increasing the quality of life for patients suffering from facial paralysis using a Robot Mask, and in social robotics using human continuous non-verbal social cues (facial expressions), characteristic for human-human interaction, to interact with robots in human environments.

During my Ph. D. I have led seminars for 4th year Undergraduates, helped plan conferences and participated in interdisciplinary collaborative projects with other departments.

Research Interests: My current research interests are in the use of technology to help increase Quality of Life so people can live comfortable and fruitful lives in society. I am especially interested in enhancing human-human, human-robot and human-computer interaction.

2010-2012. 'Cybernetics: fusion of human, machine and information systems' Program, University of Tsukuba.

I completed this interdisciplinary program that centers on cybernetics, mechatronics, and informatics, and integrates together human and robot (RT: robotics technology) functionally, organically and socially with information technology (IT).

2008-2010. Master of Engineering. Artificial Intelligence Laboratory, University of Tsukuba, Japan.

Graduated with Honors

Thesis Title: A Wearable Interface for Reading Facial Expressions Based on Bioelectrical Signals

Modules included: Pattern Recognition and Machine Learning, Artificial Intelligence, Intelligent Sensor Engineering, Usability Testing, Computer Vision.

2002-2007. Systems Engineer Metropolitana University, Caracas, Venezuela.

Academic Excellence Award (2004, 2005), Honors List (2006), GPA: 4.79 of 5.

Thesis Title: Visualization of urban growth using bi-dimensional cellular automata (Graded Outstanding)

Modules included: Data Analysis, Database Management, Software Engineering (Including Object Oriented Programming), Networks and Communication Systems, Logistics, Signal Analysis.

2006-2007. Diploma of Specialty in Telecommunications.

2001. Abitur (German high school diploma), Humboldt School, Caracas, Venezuela.

695 of 900 points corresponding to an average grade of 1.8 ('Very good') in the German 1-6 system.

Professional Experience

May 2013 – now. Postdoctoral Researcher. Leverhulme Fellow at the University of Essex.

Visiting Fellow in the School of Computer Science and Electronic Engineering working in the Embedded and Intelligent Systems (EIS) Research Group.

January 2012. Internship at The Advanced Robotic Controls Group of the Jet Propulsion Laboratory, Pasadena, California, USA

I worked with Professor A. Stoica's research group as part of a joint project with the University of Tsukuba in the area of Cognitive Robotics. I was mainly responsible for the acquisition and analysis of biosignals from the face (electromyography) and brain (EEG) for control.

2006 - 2007. Teacher Assistant in the Operating Systems Class. Universidad Metropolitana, Caracas, Venezuela

I taught undergraduate students to use the MIPS, C and Java programming environments to create projects for the Operating Systems Class, performed and corrected quizzes and final programming projects.

Summer 2006. Internship in the Software Development Area. Bekesantos C.A. Caracas, Venezuela.

I created a software solution to organize the lending of electronic materials. I was involved in all parts of the project development, from interviews with the prospective users to system design and programming implementation.

Skills

I have general skills in research project proposal writing, project management and data analysis.

Computing Skills:

- Programming languages: Matlab, Visual Basic.Net, Java, Latex and HTML.
- Database management: SQL Server

Languages:

- Spanish, German, English (Perfect Dominion)
- Japanese, French (Intermediate Level)

Teaching Skills:

- Have taught the programming side of the Operating Systems course to undergraduates as a Teacher Assistant at Metropolitana University, Caracas, Venezuela.
- Have led several seminars for undergraduates at the Artificial Intelligence Laboratory, University of Tsukuba, Japan.

Other skills:

- Knowledge of research methodologies and creation of research plans.
- Knowledge of statistical methods for data analysis with subjects.
- Experience in data and information collection (more than 100 hours of experience collecting physiological signals from subjects with mental disabilities, as well as extended experience with healthy subjects and children).
- Ability to clearly present results and write reports in technical written English.

APPENDIX

Conferences (member of the organizational board)

- International Conference on Human-Machine Systems, Cyborgs and Enhancing Devices (HUMASCEND 2013) – Program Co-Chair, Ph. D. Track Co-Chair
- International Conference on Human-Machine Systems, Cyborgs and Enhancing Devices (HUMASCEND 2012) - Publicity Chair
- Annual Cybernetics Conference 2011 - Publication Chair

Publications and Conference Papers

Journal Papers:

- Funahashi, A., **Gruebler, A.**, Aoki, T., Kadone, H., Suzuki, K., "The Smiles of a Child with Autism Spectrum Disorder During an Animal-assisted Activity May Facilitate Social Positive Behaviors - Quantitative Analysis with Smile-detecting Interface", *Journal of Autism and Developmental Disorders*, 2013 (in press)
- **Gruebler, A.**, Berenz, V., Suzuki, K., "Emotionally Assisted Human-Robot Interaction using a Wearable Device for Reading Facial Expressions," *Advanced Robotics, Special Issue on Cutting Edge of Robotics in Japan*, vol. 26, no. 10, pp. 1143–1159, 2012.

Book Chapters:

- Jayatilake, D., **Gruebler, A.**, Suzuki, K., "Robot Assisted Smile Recovery," *Cutting Edge Robotics*, Kordic, V., Lazinica, A. and Merdan, M. (Eds.), ISBN: 978-953-307-062-9, IN-TECH2010, 2010.

Refereed International Conference Proceedings:

- Suzuki, K., **Gruebler, A.**, Berenz, V., "Coaching robots with bipsignals based on human affective social behaviours" in *Proc. of the 8th ACM/IEEE International Conference on Human- Robot Interaction*, pp. 419, 2013.
- **Gruebler, A.**, Suzuki, K., "Analysis of social smile sharing using a wearable device that captures distal electromyographic signals", in *Proc. of Third International Conference on Emerging Security Technologies*, pp. 178–181, 2012.
- Jayatilake, D., Isezaki, T., **Gruebler, A.**, Teramoto, Y., Eguchi, K., Suzuki, K., "A Wearable Robot Mask to Support Rehabilitation of Facial Paralysis," in *Proc. of IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics*, pp. 1549–1554, 2012.
- **Gruebler, A.**, Berenz, V., Suzuki, K., "Coaching robot behavior using continuous physiological affective feedback," in *Proc. of 11th IEEE-RAS International Conference on Humanoid Robots*, pp. 466–471, 2011.
- **Gruebler, A.**, Suzuki, K., "Measurement of Distal EMG Signals using a Wearable Device for Reading Facial Expressions," in *Proc. of 2010 Engineering for Medicine and Biology Conference*, pp. 4594–4597, 2010.
- **Gruebler, A.**, Suzuki, K., "A wearable interface for reading facial expressions based on bioelectrical signals," in *Proc. of 2010 International Conference on Kansei Engineering and Emotion Research*, 2010.
- Jayatilake, D., **Gruebler, A.**, Suzuki, K., "An Analysis of Facial Morphology for the Robot Assisted Smile Recovery," in *Proc. of 4th International Conference on Information and Automation for Sustainability*, pp. 395 – 400, 2008.

Oral and Poster Presentations:

- **Gruebler, A.**, Berenz, B., Suzuki, K., "Seeker: Coaching free roaming robot behavior using human physiological affective feedback," in *Proc. of International Session of 30th Annual Conference of the Robotics Society of Japan*, September 2012.
- **Gruebler, A.**, Funahashi A., Kadone, H., Aoki, T., Suzuki, K., "Quantitative Analysis of Positive Facial Expressions of Children with Autism Spectrum Disorder using a Wearable Device that Captures Distal EMG", *Proc. Of the 35th Annual Meeting of the Japan Neuroscience Society*, P2-m01, 2012.
- **Gruebler, A.**, Suzuki, K., "Social Smile sharing analysis from physiological signals using a wearable device", International Conference on Human-Machine Systems, Cyborgs and Enhancing Devices,

Romania, June 2012.

- **Gruebler, A.**, Suzuki, K., "A wearable device for human-robot emotional interaction using distal facial EMG signals," Proc. of International Session of the 28th Annual Conference of the Robotics Society of Japan, 2010.

Awards, Fellowships, and Grants

- Leverhulme Visiting Fellow at the School of Computer Science and Electronic Engineering of the University of Essex 2013-2014
- Monbukagakusho Scholarship (awarded by the Ministry of Education, Culture, Sports, Science, and Technology of Japan) 2008-2010, 2010-2013.
- Global COE Young Researcher Grant, Japan, 2010-2011, 2011-2012, for investigation work on Emotionally Assisted Human-Robot Interaction using physiological signals.

Professional Memberships

- Member of the IEEE