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## Akihiko Shirai, Ph.D

at December 2009.

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To apply my wide and deep experiences of R&D in full body entertainment technologies that includes Virtual Reality, human-computer-interaction design, computer vision, robotic devices, haptics, psycho-physics and application development of high-speed sensing devices), I wish to get a permanent engineering position in an international (Jp/En/Fr) progressive environment.

**Professional Qualities** Communication skills and highly experienced in R&D activities pertaining to new entertainment technologies and applications using VR techniques especially intuitive full body or physical oriented interactions.

**Objective** A static position in R&D for new computer interaction systems that can change human life by enhancing pleasure. Creating demonstrations using haptics, new human interfaces devices and display technologies.

**Experience** *Miraikan, National Science Museum of Emerging technology and Innovation. (2008 – present) Tokyo, Japan*  
**Science Communicator in Information technology and Science**  
R&D for permanent exhibition using Laser range sensor and Enhanced Augmented Reality techniques. Be trained communication and presentation skills as science communicator who tell the emerging science to the public. Event planning and producing for emerging digital contents cooperate with Ministry of Commerce (METI).

*ENSAM Presence & Innovation Laboratory (2004 –2007) Laval, France*

**Invited Researcher for a theme park project**

“R&D on advanced computer entertainment platform centered on natural human-computer interactions and haptics sensations”. Japan Society for the Promotion of Science (JSPS), Program of Postdoctoral Fellowship for Research Abroad supported this project. Developed various new entertainment systems and educational contents for a VR theme park project in Laval city France.

*NHK Engineering Services, Inc. (2003 – 2004) Tokyo, Japan*

**Postdoctoral researcher for future TV sets**

## **Experience (cont.)**

R&D for next generation television production system using a photo-realistic real-time computer graphics and HD depth camera system (Axi-Vision, Infrared ToF). This project was instigated and funded by the National Institute of Information and Communications Technology (NICT/TAO).

*Sato Lab., Tokyo Institute of Technology. (2001 – 2004) Yokohama, Japan*

### **Doctoral student of haptics [SPIDAR] laboratory**

Research and development for new computer entertainment systems for children using haptics, A.I., real-time physics simulator and immersive large screen system. This was the main theme of his doctoral thesis. Obtained Ph.D (Engineering) from Department of Computational Intelligence and Systems Science, TITECH, Japan (<http://www.dis.titech.ac.jp/>) in March 2004.

*Criterion Software Ltd. (A subsidiary of Canon Inc. (2000 – 2001) Tokyo*

### **Development and consultation**

On secondment from Canon Inc. (Japan), lead technical support and localization of game graphics middleware product for the Japanese market.

## **Other Assignments**

- Academic event producing – A main producer on an international educational event of virtual reality contest for collegiate students. A lot of excellent projects were accepted by ACM SIGGRAPH E-Tech and Laval Virtual. ( <http://www.ivrc.org>, the 17<sup>th</sup> contest in this year.)
- Science Communicator – A professional who tell emerging science to the public coherently to move the better society with scientists and researchers.

## **Education**

**2004** Tokyo Institute of Technologies, Department of Computational Intelligence and Systems Science, Doctor of Engineering (Ph.D).

**1998** Tokyo Institute of Polytechnics (Current name: Tokyo Polytechnic University), Department of Image Engineering, Master of Engineering.

**1996** Tokyo Institute of Polytechnics (Current name: Tokyo Polytechnic University), Department of Photo Engineering, Bachelor of Engineering.

## **Additional Skills**

- 3 languages – Japanese(Native), English (Fluent), French (Fluent)
- Research & Development: From emerging technology to public exhibition with stability and coherent concept.
- Programming: C/C++, C#, OpenGL, DirectX, XNA, HLSL, PHP, VBScript, ActionScript, Java, Databases on Windows and Linux environments.
- Tools + SDK: Photoshop, 3DSMax, Maya, Virtools, etc.
- Hardware (AV, Electronics, Robotics, Optics and Embedded systems)
- Networking: From cabling, socket programming to SNS admin
- Illustration

## **Awards**

- Best paper award - Sandbox 2007, ACM SIGGRAPH Video Game Symposium, “WiiMedia: motion analysis methods and applications using a consumer video game controller”
- Laval Virtual Award 2007 - Virtual Character Award “JaWii’s Virtual Fencing”
- Visual science festival award for “A haptic entertainment system using real-time physics simulator” from *Nikkei Science magazine* (Japanese version of “Scientific American”). (November, 2003)
- Best Multilingual and/or Omni lingual award for “Tangible Playroom”, ACM SIGGRAPH SIGKIDS2003. (June, 2003)
- Excellent award for “the Labyrinth Walker”, DiVA, magazine of society for art and science. (April, 2003)
- Scientific encouragement award for research of Tangible Playroom, Virtual Reality Society of Japan. (March, 2003)
- Best paper award for research of “Tangible Playroom”, Transaction of society for art and science. (March, 2003)
- Best paper award for “Penguin Hockey: A Tangible Playroom for Children”, NICOGRAPH International (May, 2002)

## **Interests**

- R&D for new entertainment systems beyond the current video games
- Relationship between science, technology and society.
- Hobby – Playing with my sons to find new childish plays.

## **Reference**

Refer to <http://akihiko.shirai.as/projects/>

## Academic Qualifications

- Ph.D. in Engineering, 2004, Tokyo Institute of Technology, Japan.
- M.A. in Engineering, 1998, Tokyo Institute of Polytechnics, Japan.
- B.A. in Engineering, 1996, Tokyo Institute of Polytechnics, Japan.

## Past Research projects



**[Tangible Playroom]**



**[4K digital cinema]**

- **VR and entertainment system design and development**
  - Robotics and Haptics for entertainment
  - Tangible Playroom series (Haptic interaction platform for infants)
  - WiiMedia (New utilization project for video game interface WiiRemote)
  - RoboGamer (Physically connected game playing robot using GPGPU)
  - SPIDAR (String based haptics interface)
  - Springhead (Open source real-time physics engine)
- **Graphics and video processing**
  - 4K Digital Cinema (Production and screening)
  - Augmented Distortion (Efficient deformation for low polygon model)
  - GPUVision (Ultra fast computer vision on GPU)
  - LuminaStudio (Real-time video composing on GPU)
  - Axi-Vision (application for HD resolution Infrared ToF depth camera)

## Special interests

- R&D for new entertainment systems
- Design and application for haptics, new devices and Virtual reality systems
- Physical evaluation of human experiences and interactions in public space
- Immersive screen environment, Graphics, computer vision, physics simulation

## Teaching experience

### ***Invited Researcher (2004-2007)***

ENSAM P&I Lab, France. *TP Lecture: "How to use VR techniques for new entertainment systems". R&D for theme park attraction using VR.*

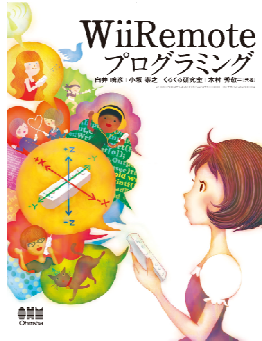
### ***Part-time Lecturer (2002-2004, 2007-2009) \*abstracts***

"Media Arts", Center for the Study of World Civilizations, TITECH, Japan

"Computer Games", Liberal Arts, International Christian University, Japan

"Information Processing", Department of Arts, Tokyo Institute of Polytechnics

## Leading Publications



- **Book: “WiiRemote Programming”, Ohmsha Japan. ISBN 978-4-274-06750-1** programming textbook for WiiRemote in C++, C#, Processing and ActionScript.
- “WiiMedia: motion analysis methods and applications using a consumer video game controller”, Akihiko SHIRAI, et al, Sandbox: an ACM SIGGRAPH Video Game Symposium, San Diego, 2007 (**Best paper award**).
- “Entertainment Applications of Human-scale Virtual Reality Systems”, Akihiko Shirai, et al. The fifth Pacific-Rim Conference on Multimedia (PCM2004) Special Session: Human-scale VR and Interaction, Tokyo, Japan, pp.31-38, 2004.
- “Entertainment systems”, Akihiko Shirai, The Journal of the Society for Art and Science, Vol. 3 No. 1, pp.22-34, 2004.
- "Penguin Hockey: A Tangible Playroom for Children", Akihiko Shirai, Shouichi Hasegawa, Yasuharu Koike and Makoto Sato, The Journal of the Society for Art and Science, Vol. 1 No. 3 pp.117-124. 2002.

## Presentations



**[Fantastic**

**Phantom Slipper]**



**[GPUVision]**



**[Labyrinth Walker]**

- “Fantastic Phantom Slipper: A mixed reality amusement system using a foot interface”, Akihiko Shirai, Masaru Sato, Machiko Kusahara, Yuichiro Kume, Transactions Virtual Reality Society of Japan, Vol.4, No.4, pp.691-698, 1999.
- "Information presentation to human feet by vibro skin stimulus", Yuichiro Kume, Akihiko Shirai, Toyohiko Hatada, Transactions Virtual Reality Society of Japan, Vol.3, No.4, pp.83-88, 1998.
- “Challenging the Unknown”IEEE 125th Anniversary (invited speech with Dr. Mohri)
- “The dream of Kaguya – Extreme High definition 4K film production ” JSTC2009
- “Tangible Playroom”, ACM SIGGRAPH SIGKIDS2003, June, 2003.
- "A New Step-in-Place Locomotion Interface for Virtual Environment With Large Display System” ,Makoto Sato,et al., ACM SIGGRAPH 2002 Emerging Technologies, 2002.
- “Penguin Hockey: A Virtual Reality game system for children”, Akihiko Shirai, Shouichi Hasegawa, Yasuharu Koike, Makoto Sato, International Workshop on Entertainment Computing (IWEC2002), May 2002.
- “Foot Interface: Fantastic Phantom Slipper”, Akihiko Shirai, Masaru Sato, Yuichiro Kume, Machiko Kusahara, ACM SIGGRAPH'98 Enhanced Realities, Orlando, Florida U.S.A., 1998.

**Professional Memberships**

*ACM SIGGRAPH*

*Student Competition Execution committee, Virtual reality society of Japan*

*Councilor, Society for art and science*

**Program committee, Session organizer**

**Reviewer experience**

- *Session Chair, Laval Virtual ReVolution* (world wide VR demonstration competition of Laval Virtual. 2006, 2007, 2008, 2009).
- *Cultural difference of VR researcher and artists between Japan and France* (round table of Laval Virtual 2006).
- *Video games and Virtual Reality: beyond the joystick* (keynote and round table of Laval Virtual 2005).

**Program committee for International Conferences**

- IEEE VR
- International Conference on Advances in Computer Entertainment Technology (ACE)
- VRIC, International Conference of Virtual Reality (IEEE France)

**Reviewer for Journals and Transactions**

- Society of Art and Science
- Virtual Reality Society of Japan
- Organizer of birds of a feather Meeting: "International Virtual Reality Contest (IVRC)" (SIGGRAPH 2002-2009)
- ENSAM-JAIST: Student Exchange Contract (2006-)
- IVRC-Laval Virtual Project Exchange (2003-2006, 2007-2010)

**International Cooperation**