

BIOGRAPHICAL SKETCH

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NAME: Gauthier, Jean-Marc

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Associate Professor - Department Head

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
Ecole Nationale Supérieure d'Architecture de Paris-Belleville, France, Paris	OTH	1986	Architecte DPLG
ITP Interactive Telecommunications Program, Tisch School of the Arts, New York University, New York City, New York	MOTH	05/1998	Interactive Media

A. Personal Statement

I am an award winning interactive designer involved with research on scientific visualization using virtual reality (VR), mixed reality (XR) and the metaverse. My interactive projects include manipulation of virtual protein in virtual reality, augmented modeling and simulation of the lunar surface at a resolution of 1 pixel per 50 cm, virtual wildlife (rivers, forests and virtual eco-systems) at a resolution of 1 pixel per 20cm. I currently develop virtual production studios using dynamic building blocks that can parse data sets (motion capture, lighting setup, camera work) from real movie sets. For the Amazon Catalyst project, I integrated a machine learning system evaluating the spatial experience of someone visiting a virtual world for the engineering community.

My virtual reality installations have been presented at domestic and international venues. I have written books on creating virtual worlds, the production of real-time 3D animations and video games. My background as an architect and animator took me in directions that have crossed over many disciplines and fascinating challenges - going as far back as teaming up with a brain surgeon for interactive visualization, my work on the visualization of the genotypes of the world's bird species or recreating in virtual reality - wildlife environments of the Pacific Northwest.

My fields of study are virtual reality, innovative technologies, 3-D visualization, dynamic simulations, animation, & storytelling. My expertise covers production of virtual worlds for the metaverse (design, programming and user testing), user interface design (UI), user experience design (UX), mixed reality (XR) and applications of innovative technology.

Videos, <https://vimeo.com/user6568702> Company site, www.tinkertoo.net Company site, www.autobotik.com Personal site, www.globaltinkering.net

- Gauthier J. Adaptation in Virtual worlds. Resilience between Mitigation and Adaptation. 2020. Available from: https://www.unipapress.it/_upload/book/227/article/37 DOI: 10.19229/978-88-5509-096-4/392020
- Gauthier J. Dynamic Virtual Proteins: Visualization, Interaction and Collaboration in Virtual Reality. 25th ACM Symposium on Virtual Reality Software and Technology. 2019. DOI: 10.1145/3359996.3365050
- Gauthier J. Building Interactive Worlds in 3D: Virtual Sets and Pre-visualization for Games, Film & the Web. Focal Press, Elsevier. 2005.
- Gauthier J. Creating Interactive Actors and their Worlds. USA: Morgan Kaufman Publishers; 2001.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2020 -	Associate Professor - Department Head, Virtual Technology & Design, College of Art and Architecture, University of Idaho, Moscow, ID
2018 -	Research Lab Supervisor - Virtual Reality Lab, Virtual Technology & Design, Moscow, ID
2018 -	Team Partner, Autobotik, Singapore
2016 -	Associate Professor, Virtual Technology and Design, College of Arts and Architecture, University of Idaho, Moscow, Moscow, ID
2014 - 2018	Founder & Managing Director, Tinkertoo, Singapore
2010 - 2014	Associate Arts Professor, Animation & Digital Arts MFA Program, Tisch School of the Arts Asia, New York University, Singapore
2010 - 2014	Chair Animation & Digital Arts MFA Program, Tisch School of the Arts Asia, New York University, Singapore
2008 - 2010	Assistant Arts Professor, Animation and Digital Arts MFA Program, Tisch School of the Arts Asia, New York University, Singapore
2008 - 2010	Director, Animation and Digital Arts MFA Program, Tisch School of the Arts Asia, Singapore
2000 - 2008	Assistant Arts Professor, Interactive Telecommunications Program, Tisch School of the Arts, New York University, New York City, NY
1999 -	Tinkering, Founder & Principal, New York City/ Pullman, NY
1998 - 2000	Adjunct, Interactive Telecommunications Program, Tisch School of the Arts, New York University, New York City, NY
1986 - 1998	Architect DPLG, Jean-Marc Gauthier Architecte, Paris

Honors

2022	Real Time Live!, ACM SIGGRAPH ASIA 2022 Daegu (South Korea)
2019	Real Time Live!, ACM SIGGRAPH ASIA 2019 Brisbane (Australia)
2019	Best Virtual Reality Demo Award, Sydney, Australia, ACM VRST
1990	Delano-Aldrich Fellowship, American Institute of Architects
1986	Villa Medicis Hors-les-Murs Award, Ministere des Affaires Etrangeres

C. Contribution to Science

1. Gauthier JM. and Wróblewski F. B. Augmenting Virtual Lunar Terrain with Procedural and Machine Learning Models in Real-time. A video of the virtual reality simulation can be found at <https://vimeo.com/808028524>

We merge virtual topography and automated augmentation at the lunar south pole to create a real-time procedural landscape. We populate digital elevation models (DEMs) of Leibnitz beta plateau with procedurally generated crater geometry to visually model lunar materials and potential hazards in real time. We feed DEM data to simulate a live data stream into Adobe Substance and Unreal Engine 5 (UE5) to create a hyper-elevation model: a DEM where the 3D mesh of the local scene is adjusted in higher resolution than the original DEM. Through the generation of craters in this hyper-elevation model, by seeding or random distribution, we consider the potential for exploring dynamic new environments with complex maneuvers, scientific observation, and for Artemis mission objectives. To generate crater geometry, we use an averaged topographic profile of lunar craters <2km diameter to serve as a template element. Once the final texturing elements are created in Substance, we assign these textures to topographic regions based upon the crater geometry and illumination.

- a. Gauthier J. Building Interactive Worlds in 3D: Virtual Sets and Pre-visualization for Games, Film &

the Web. Focal Press, Elsevier. 2005.

2. Ytreberg, M., (PI) et al, Gauthier, JM. EPSCOR Track-2 NSF. Genome to Phenome: Using Biophysical Protein Models to Map Genetic Variation to Phenotypes. A video of the virtual reality presentation can be found at <https://vimeo.com/390369362>

Current tools for visualizing and interacting with virtual proteins achieve a high level of complexity that creates a “communication barrier between structural biologists and other disciplines”. Visualization tools may be difficult to use by a mixed audience of experts and non-experts. Challenges are not only technical but present cognition obstacles that may prevent people from sharing important knowledge between experts and non-experts. This can impact collaborations regarding engineering and decision making about new drugs, vaccines or treatments.

The DVP project is funded by a NSF grant "RII Track-2 FEC: Using Biophysical Protein Models to Map Genetic Variation to Phenotypes".

A similar research is Gauthier JM. and McGrath I. Virtual Protein Builder (Performance), 2019. Real Time Live!, Siggraph Asia 2019, Brisbane, Australia. A video of the presentation can be found at <https://vimeo.com/367944593>

- a. Gauthier J. Dynamic Virtual Proteins: Visualization, Interaction and Collaboration in Virtual Reality. 25th ACM Symposium on Virtual Reality Software and Technology. 2019. DOI: 10.1145/3359996.3365050

3. VR Classrooms in the metaverse 2023 Virtual microbiology lab: a video of the metaverse demo can be found at <https://vimeo.com/815544677> Virtual Forest: a video of the meataverse demo can be found at <https://vimeo.com/761718696>

Brenda teaching in the virtual microbiology lab shows the real-time experience of students and faculty inside a VR Classroom. The "VR Classroom" is a metaverse project focusing on mentoring and online experiential learning for faculty and students at University of Idaho. Designed by Jean-Marc Gauthier and Ken Udas, in collaboration with Payton Finney, Sydney Tverdy. Many thanks to Brenda Schroeder. 03/2023.

- a. Gauthier J. Creating Interactive Actors and their Worlds. USA: Morgan Kaufman Publishers; 2001.

4. Gauthier JM. and Finney P. Moments in Nature - Virtual Reality installation: a video of the virtual reality demo can be found at <https://vimeo.com/779552839>

A novel approach to storytelling in the metaverse. The video shows an example of a viewer's experience immersed in the virtual ecosystem of Paradise creek. During the past two years, we recreated in virtual reality a small river running between Moscow (Idaho) and Pullman (Washington). Realizing some of the original environment was altered, we created a story where herons and humans encounter each other in unexpected ways and the original river space could be discovered.

The story unfolds as one viewer, or several viewers guide the heron's flight. Telling the story of the heron is a collaborative effort to find and rescue the red heron. Viewers witness on screen their real-time interaction with the story unfolding inside the virtual river. Each viewer guides the interactive rescue of the red heron. After this first step, more of the ecosystem of the river will be explored with the help of the audience. More stories will be told, and the audience will be introduced to virtual cameras that allow finer interactions with water, plants and living creatures inside the virtual worlds.

Credits: Jean-Marc Gauthier, Payton Finney. Narration by Savannah Thomson. Music and sound design by Alex Ho. Thank you to Emma Ferguson, Clayton Christensen and Randall Erickson. Jean-Marc Gauthier, All Rights Reserved. December 2022.