

# BINH HUY LE

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## PROFESSIONAL EXPERIENCES

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<b>Principal Research Scientist</b> AMD Research, Santa Clara	2022 - now
<b>Senior Research Scientist</b> Search for Extraordinary Experiences Division (SEED), Electronic Arts	2017 - 2022
<b>Post Doctoral Researcher</b> Disney Research Pittsburgh and Pixar Research Group	2014 - 2016
<b>Summer Research Intern</b> Computational Photography team, Nokia Research Center, Sunnyvale, CA	2013
<b>Research Assistant and Teaching Assistant</b> University of Houston	2008 - 2014

## EDUCATION

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<b>Ph.D. in Computer Science</b> University of Houston ( <i>Dissertation: Example-based Rigging and Real-time Animation of Characters with Linear Skinning Models</i> )	2008 - 2014 (GPA: 3.938)
<b>B.S. in Computer Science</b> Vietnam National University, Hanoi	2003 - 2007 (GPA: 8.13/10)

## PUBLICATIONS

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- [P1] **END-TO-END 3D FACE RECONSTRUCTION WITH EXPRESSIONS AND SPECULAR ALBEDOS FROM SINGLE IN-THE-WILD IMAGES** [\[URL\]](#)  
Qixin Deng, *Binh Huy Le*, Aobo Jin, and Zhigang Deng  
ACM International Conference on Multimedia (MM) 2022
- [P2] **DIRECT DELTA MUSH SKINNING COMPRESSION WITH CONTINUOUS EXAMPLES** [\[URL\]](#)  
*Binh Huy Le*, Keven Villeneuve, and Carlos Gonzalez-Ochoa  
ACM Transactions on Graphics (Proceeding of ACM SIGGRAPH 2021), 40(4), August 2021, article 72  
(*Highlighted in the Two Minute Papers Youtube channel*) [\[URL\]](#)
- [P3] **PLAUSIBLE 3D FACE WRINKLE GENERATION USING VARIATIONAL AUTOENCODERS** [\[URL\]](#)  
Qixin Deng, Luming Ma, Aobo Jin, Huikun Bi, *Binh Huy Le*, and Zhigang Deng  
IEEE Transactions on Visualization and Computer Graphics (TVCG) 2021
- [P4] **DIRECT DELTA MUSH SKINNING AND VARIANTS** [\[URL\]](#)  
*Binh Huy Le* and JP Lewis  
ACM Transactions on Graphics (Proceeding of ACM SIGGRAPH 2019), 38(4), July 2019, article 113
- [P5] **HIGH-QUALITY OBJECT-SPACE DYNAMIC AMBIENT OCCLUSION FOR CHARACTERS USING BI-LEVEL REGRESSION** [\[URL\]](#)  
*Binh Huy Le*, Henrik Halen, Carlos Gonzalez-Ochoa, and JP Lewis  
Proceedings of the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (I3D) 2019

- [P6] **INTERACTIVE CAGE GENERATION FOR MESH DEFORMATION** [URL]  
*Binh Huy Le* and Zhigang Deng  
Proceedings of the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (I3D) 2017
- [P7] **REAL-TIME SKELETAL SKINNING WITH OPTIMIZED CENTERS OF ROTATION** [URL]  
*Binh Huy Le* and Jessica K. Hodgins  
ACM Transactions on Graphics (Proceeding of ACM SIGGRAPH 2016), 35(4), July 2016, article 37  
(*Highlighted in the SIGGRAPH 2016 Technical Papers Trailer*) [URL]
- [P8] **SPECTRAL ANIMATION COMPRESSION** [URL]  
Chao Wang, Yang Liu, Xiaohu Guo, Zichun Zhong, *Binh Le*, and Zhigang Deng  
Journal of Computer Science and Technology, 30(3), May 2015, pp. 540-552
- [P9] **ROBUST AND ACCURATE SKELETAL RIGGING FROM MESH SEQUENCES** [URL]  
*Binh Huy Le* and Zhigang Deng  
ACM Transactions on Graphics (Proceeding of ACM SIGGRAPH 2014), 33(4), July 2014, article 84
- [P10] **MARKER OPTIMIZATION FOR FACIAL MOTION ACQUISITION AND DEFORMATION** [URL]  
*Binh Huy Le*, Mingyang Zhu, and Zhigang Deng  
IEEE Transactions on Visualization and Computer Graphics (TVCG), 19(11), Nov. 2013, pp. 1859-1871  
(*Also presented at Symposium on Computer Animation (SCA) 2013*)
- [P11] **TWO-LAYER SPARSE COMPRESSION OF DENSE-WEIGHT BLEND SKINNING** [URL]  
*Binh Huy Le*, and Zhigang Deng  
ACM Transactions on Graphics (Proceeding of ACM SIGGRAPH 2013), 32(4), July 2013, article 124
- [P12] **SMOOTH SKINNING DECOMPOSITION WITH RIGID BONES** [URL]  
*Binh Huy Le* and Zhigang Deng  
ACM Transactions on Graphics (Proceeding of ACM SIGGRAPH Asia 2012), 31(6), Nov. 2012, article 199  
(*Highlighted in the SIGGRAPH Asia 2012 Technical Papers Video Trailer*) [URL]  
Industry uses: Naughty Dog, EA, SideFX (Houdini), etc. (full list: <http://binh.graphics/misc/SSDR/>)
- [P13] **LIVE SPEECH DRIVEN HEAD-AND-EYE MOTION GENERATORS** [URL]  
*Binh Huy Le*, Xiaohan Ma, and Zhigang Deng  
IEEE Transactions on Visualization and Computer Graphics (TVCG). 18(11), Nov. 2012, pp. 1902-1914
- [P14] **PERCEPTUAL ANALYSIS OF TALKING AVATAR HEAD MOVEMENTS: A QUANTITATIVE PERSPECTIVE** [URL]  
Xiaohan Ma, *Binh Huy Le*, and Zhigang Deng  
Proceedings of the SIGCHI International Conference on Human factors in computing systems (CHI) 2011, pp. 2699-2702
- [P15] **STYLE LEARNING AND TRANSFERRING FOR FACIAL ANIMATION EDITING** [URL]  
Xiaohan Ma, *Binh Huy Le*, and Zhigang Deng  
Proceedings of the ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA) 2009, pp. 114-123
- [P16] **AN INTERACTIVE GEOMETRIC TECHNIQUE FOR UPPER AND LOWER TEETH SEGMENTATION** [URL]  
*Binh Huy Le*, Zhigang Deng, James Xia, Yu-Bing Chang, and Xiaobo Zhou  
Proceedings of the 12<sup>th</sup> International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2009, pp. 968-975

## OPEN SOURCE LIBRARY

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### [P17] DEM BONES

An automated tool to learn the Linear Blend Skinning from a set of example poses based on [P12].

Press release: <https://www.ea.com/seed/news/open-source-dem-bones>

GitHub: <https://github.com/electronicarts/dem-bones>

Industry uses (full list: <http://binh.graphics/misc/SSDR/index.html#dembones>)

- EA Studios: Need for Speed Heat, Apex Legends, Star Wars: Squadrons, Medal of Honor: Above and Beyond
- Houdini: starting from version 18.0.499 (SideFX lab 1.173)

## PATENTS

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### [P18] HIGH-QUALITY OBJECT-SPACE DYNAMIC AMBIENT OCCLUSION

*Binh Huy Le*, and John Peter Lewis

US patent: *US20200098168A1* [\[URL\]](#)

### [P19] SYSTEMS AND METHODS FOR VIRTUAL ENTITY ANIMATION

*Binh Huy Le*, and Jessica Hodgins

US patent: *US20180096510A1* [\[URL\]](#)

### [P20] VISUAL PERCEPTION MATCHING COST ON BINOCULAR STEREO IMAGES

*Binh Huy Le*, Daniel A. Vaquero, and Timo Ahonen

US patent: *US9430834B2* [\[URL\]](#)

## TALKS

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- Real Time Character Animation: Deformation, Rendering, and Beyond** *October 02, 2019*  
Dept. of Computer Science, University of Houston [\[URL\]](#)
- Direct Delta Mush Skinning and Variants** *August 1, 2019*  
SIGGRAPH 2019 Technical Paper presentation, Los Angeles, CA [\[URL\]](#)
- Real-time Skeletal Skinning with Optimized Centers of Rotation** *July 25, 2016*  
SIGGRAPH 2016 Technical Paper presentation, Anaheim, CA [\[URL\]](#)
- Real-time Skinning and Deformation tutorial** *May 26, 2014*  
The 27th International Conference on Computer Animation and Social Agents [\[URL\]](#)
- Example-based Real-time Skinning Animation: Algorithms and Applications**  
Disney Research Pittsburgh *May 20, 2014*  
Dept. of Electrical Engineering & Computer Science, University of Central Florida *March 24, 2014*  
Dept. of Computer Science, University of Massachusetts at Boston *March 3, 2014*
- Two-Layer Sparse Compression of Dense-Weight Blend Skinning** *July 25, 2013*  
SIGGRAPH 2013 Technical Paper presentation, Anaheim, CA [\[URL\]](#)
- Marker Optimization for Facial Motion Acquisition and Deformation** *July 19, 2013*  
ACM SIGGRAPH/Eurographics Symposium on Computer Animation, Anaheim, CA
- Smooth Skinning Decomposition with Rigid Bones** *December 1, 2012*  
SIGGRAPH Asia 2012 technical Paper presentation, Singapore

## PROFESSIONAL ACTIVITIES

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### Program Committee

- ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA) 2015, 2016, 2017, 2018
- IEEE International Conference on Computer Animation and Social Agents (CASA) 2014, 2015, 2016, 2022
- ACM SIGGRAPH Conference on Motion in Games (MIG) 2016
- International Symposium on Visual Computing (ISVC) 2015

### Paper Review

International Conference and Exhibition on Computer Graphics & Interactive Techniques (SIGGRAPH, SIGGRAPH Asia), Transactions on Graphics (TOG), Computer Graphics Forum (CGF), Symposium on Computer Animation (SCA), Computer Animation and Social Agents (CASA), Pacific Graphics (PG), The Visual Computer (TVCJ), International Symposium on Visual Computing (ISVC), Transactions on Affective Computing (TAC), Computers & Graphics (CAD/CG), Transactions on Human-Machine System (THMS), Graphics Interface (GI), International Journal of Image and Graphics (IJIG), Journal of Virtual Reality and Broadcasting (JVRB), Virtual Reality (VR), International Conference on Multimedia & Expo (ICME), International Conference on Systems, Man, and Cybernetics (SMC)

## SELECTED HONORS AND AWARDS

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<b>Best Ph.D. Student Award</b> Department of Computer Science, University of Houston <a href="#">[URL]</a>	2013
<b>Best Overall Poster Award</b> PhD Research Showcase, Department of Computer Science, University of Houston <a href="#">[URL]</a>	2013
<b>Friends of NSM Graduate Fellowship</b> College of Natural Sciences and Mathematics, University of Houston	2013
<b>NSMAA Scholarship for Graduate Students</b> College of Natural Sciences and Mathematics, University of Houston <a href="#">[URL]</a>	2010, 2011, 2012, 2013
<b>Vietnam Education Foundation Fellowship Grant</b> ( <i>\$54,000 from the U.S. Government</i> )	2008
<b>Rank 56<sup>th</sup>, ACM-ICPC World Finals Programming Contest</b> ( <i>88 teams chosen for the World Finals among 6,099 teams from 1,756 universities in 82 countries</i> ) <a href="#">[URL]</a>	2007
<b>First Prize, ACM-ICPC Regional Programming Contest</b> Asia region, Hanoi site, Vietnam	2006
<b>Rank 8<sup>th</sup>, ACM-ICPC Regional Programming Contest</b> Asia region, Coimbatore site, India	2005
<b>First Prize, Vietnam Olympiad in Informatics for High School Students</b> ( <i>Top score</i> )	2003
<b>Third Prize, Vietnam Olympiad in Informatics for High School Students</b>	2002

## MEDIA COVERAGES

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- Dem Bones - Awesome Animation Tool ... From EA?!?!** *February 2021*  
Gamefromscratch [\[URL\]](#)
- Research from UH Computer Science: Out of the Lab and into Popular Use** *January 2020*  
University of Houston news [\[URL\]](#)
- Open Source - Dem Bones** *October 2019*  
Rigging Dojo [\[URL\]](#)
- Disney Research Takes a Crack at Better Character Skinning** *July 2016*  
Lesterbanks [\[URL\]](#)
- Character Animation Technique Produces Realistic Looking Bends at Joints** *July 2016*  
EurekaAlert! [\[URL\]](#)
- New Method Automates Skeletal Design for Character Animation** *July 2014*  
Department of Computer Science, University of Houston news [\[URL\]](#)
- Avatars, Virtual Humans Among Topics Covered at UH Event** *May 2014*  
University of Houston news and events [\[URL\]](#)
- Computer Science Recognizes Students for Academic Excellence** *June 2013*  
Department of Computer Science, University of Houston news [\[URL\]](#)
- Students Compete in Brain Games** *November 2009*  
The Daily Cougar newspaper (official student newspaper of the University of Houston) [\[URL\]](#)

## REFERENCES

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**Dr. John P. Lewis (a.k.a. JP Lewis)**

Staff Research Scientist, Google AI

Email: [noisebrain@gmail.com](mailto:noisebrain@gmail.com)

Homepage: <http://www.scribblethink.org>

**Dr. Jessica K. Hodgins**

Research Manager and Operations Lead, Facebook AI Research

Professor, Computer Science and Robotics, Carnegie Mellon University

Email: [jkh@cs.cmu.edu](mailto:jkh@cs.cmu.edu)

Homepage: <http://www.cs.cmu.edu/~jkh>

**Dr. Zhigang Deng**

Professor, Department of Computer Science, University of Houston

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Homepage: <http://graphics.cs.uh.edu/zdeng>