Free Software for Computer Animation, Virtual Reality, Film and Games

Jernej Barbic
Associate Professor and Viterbi Early Career Chair, Computer Science

CURRENT RESEARCH

Fast physics for simulation, training and product testing

Dr. Jernej Barbic of the University of Southern California works in the areas of computer graphics and animation, virtual reality, interactive physics, computer games, as well as rapid product design in engineering. The revolutionary science-fiction author Jules Verne was quoted, "Anything one man can imagine, other men can make real."

Dr. Jernej Barbic identifies with Verne's message: film visual effects inspire us. They cultivate our imagination and instill within us the notion that, much in the way Captain Nemo's 19th century submarine became a reality, anything that can be dreamt, visualized or simulated, can later be realized and manufactured. Dr. Barbic's work on virtual reality and fast simulation makes it possible to design better, cheaper and safer products such as cars and airplanes. It also makes film and computer games more realistic and fun, and surgical and heavy machinery simulation-based training more reliable. Dr. Barbic is also a strong proponent of free, open-source software. He devotes a significant amount of time to writing free, quality, re-usable software implementing his ideas, as well as those of other leading scientists. Thus, he wrote Vega FEM, a free software library (100,000 lines of C/C++) for deformable object animation that has been used on several films and many other endeavors in computer graphics and related fields. Computer graphics, animation and virtual reality have made monumental strides in the last few years with the rapid advancement of computer processing power. However, realistic simulations require realistic, complex models, which are computationally demanding even for today's computers. Dr. Barbic is taking these fields further by making the underlying mathematics...

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AFFILIATION

University of Southern California

EDUCATION

- Post-Doctoral Research in Computer Science, 2009 , Massachusetts Institute of Technology
- Ph.D. in Computer Science 2007 , Carnegie Mellon University
- Diploma in in Mathematics, 2000 , University of Ljubljana, Slovenia

AWARDS

- 2014 The Okawa Research Award
- 2014 Sloan Research Fellow
- 2011 TR35 "35 Innovators Under 35" (in the world) Award
- NSF Career Award
- Film Credits, The Hobbit: The Desolation of Smaug (2013)
- and 3 more...

RESEARCH AREAS

Technology, Computational Sciences / Mathematics, IOT, Devices, Data, Veteran's Causes

FUNDING REQUEST

Your contributions will be used to further improve these new technologies until they are developed enough for public use. Vega FEM is already operational and free to the public but requires further funding to continue improving the software. The botanical simulator and virtual assembly projects still require further development. Contributions will allow for training of students and postdoctoral researchers, the purchase of newer and faster computer equipment, and other associated laboratory costs.