Martin Pražák, PhD

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—— Employment History

July 2018 – present

R&D Supervisor, Creatures
Double Negative Visual Effects (London, United Kingdom)

- providing technical supervision and guidance for 4 teams delivering the technology used for all creature work in DNEG:
  - *Crowds* – crowd frameworks, animation synthesis, simulation, rig processing and rendering in a variety of DCCs (Maya, Houdini, Clarisse, Katana)
  - *Fur* – fur evaluation framework and data representation, procedural synthesis, grooming, simulation and rendering in Maya, Houdini and Clarisse
  - *Rigging Tech* – a platform-agnostic framework for rigging and mesh deformation
  - *Rigging Tools* – an automatised rig-building framework for component-based rigging

  Hands-on approach to software architecture, design, development and integration of technology into DCCs and pipeline.

Jan 2015 – June 2018

Lead R&D Developer, Crowd Tools
Double Negative Visual Effects (London, United Kingdom)

- led a team of developers working on a comprehensive crowd toolset:
  - Maya plugins for animation and rig conversion and export
  - Houdini and Maya frameworks for crowd authoring
  - Mantra, Katana and Clarisse integration for procedural geometry generation
  - proprietary file formats for efficient and portable data representation
  - portable libraries to maximise code re-use
- the solutions were implemented primarily in C++, with Python for automatisation and pipeline integration, and DCC-specific languages for user-facing functionality (VEX, MEL)
- was responsible for roadmap, feature design, system architecture, mentoring, cooperation with other teams and providing support for users (artists)
- hands-on approach to leadership – actively used C++ to develop features in a range of DCCs, and to mentor more junior members of the team
- covered crowd technology requirements for all shows in production

Jan 2012 – Dec 2014

R&D Developer, Crowd Simulation
Double Negative Visual Effects (London, United Kingdom)

- worked as primary developer of a crowd framework, implemented from ground-up
- was responsible for architecture, design and development of the full system (C++ with Python integration and API, with a large number of both in-house and 3rd-party libraries)
- designed a framework aimed solely at specific requirements of the film industry:
  - data-driven animation synthesis, with high and low level behaviour controls
  - controllable, highly predictable and reproducible simulation results
  - extensible using plugins and via a scripting interface
  - stand-alone GUI (Qt, accelerated OpenGL viewport), with application-agnostic simulation core, open to integration into other software packages
  - tight integration with existing pipeline (inputs/outputs, batch simulation, rendering)

June 2011 – Sept 2011

Animation Technology Intern
Walt Disney Animation Studios (Los Angeles, United States of America)

- worked on a proof-of-concept dynamic registration of 3D models to 2D animations

2008 – 2011

Part-time Demonstrator and Occasional Lecturer
Trinity College Dublin (Ireland)

- Computer Animation (MSc. Interactive Entertainment)
- Practical Project in Robotics
- C and C++ Programming
- Mathematics

June 2007 – August 2007

Computer Graphics Programmer Intern
Aardman Animations (Bristol, United Kingdom)

- worked on a feather generation and rendering system (Maya, Renderman, C++)

━━━ Education

**April 2008 –
Dec 2011**

PhD, Computer Science
Trinity College Dublin, Department of Computer Science and Statistics (Ireland)
Graphics, Vision and Visualisation Group

Thesis topic: Locomotion for Crowd Animation
(supervised by Prof. Carol O'Sullivan, examiners: Dr. John Dingliana, Dr. Ronan Boulic)

- researched data-driven character animation for real-time crowd simulation
- gained practical experience with motion capture pipeline (Vicon)
- acquired experience with crowd system development - simulation, animation, behaviour

PhD research projects and interests:
- *Natural Movers* – a database of human motions (9000+ normalised motion capture clips from 83 actors performing a consistent set of actions)
- *Metropolis* – developed a highly efficient animation system for a real-time crowd simulator
- *As Rigid As Possible* shape manipulation applied to modelling of humanoid characters
- *Human Perception* and its connection to character animation

For a complete list of my publications and more details about my PhD research, please refer to my online portfolio.

**Sept 2005 –
June 2008**

Ing., Information Technology (equivalent to MSc. in Computer Science)
Brno University of Technology, Faculty of Information Technology (Czech Republic)
Department of Computer Graphics and Multimedia

Graduated with Distinction (1st class honours equiv.), Dean's award for Master's Thesis.
Thesis topic: *Image-based Material Editing: Changing Object Appearance by Adding Fur*
(supervised by Doc. Dr. Ing. Pavel Zemčík and Dr. Erik Reinhard)

- computer graphics course, with both taught and research elements
- covered topics: image processing, procedural geometry, photorealistic rendering and Renderman shaders

**Sept 2002 –
June 2005**

Exchange study under Socrates / Erasmus Programme
University of Bristol (United Kingdom), Department of Computer Science

- worked on master project under Dr Erik Reinhard's supervision

**Sept 2002 –
June 2005**

Bc., Information Technology (equivalent to BSc. in Computer Science)
Brno University of Technology, Faculty of Information Technology (Czech Republic)

Graduated with Distinction (1st class honours, ranked 6th of 164 students).
Thesis topic: *Tools for Polygonal Models' Symmetry Estimation*
(supervised by Doc. Ing. Přemysl Kršek, PhD)

- developed a toolset for symmetry estimation of meshes reconstructed from CT scans

━━━ Skills and Interests

Skills

- excellent knowledge of object-oriented programming, template metaprogramming and application design in C++
- extensive experience with common libraries (STL, OpenGL, Qt, Boost, OpenEXR, Alembic, WildMagic and more)
- good knowledge of rendering domain-specific languages (GLSL, renderman, OSL)
- practical experience with plugins programming for Autodesk Maya, SideFX Houdini and Isotropix Clarisse
- practical experience with optical motion capture systems (Vicon)
- power user command of Unix/Linux systems and Windows

Nationality

Dual nationality – British and Czech (EU).

Interests

Apart from my passion for computer graphics and animation, I am interested in gadgets and electronic devices – as an active member of London Hackspace, I like to make them useful in other ways than they were originally intended.

I am also an orthodox tea-drinker (traditional Japanese and Chinese teas) with an interest in Asian cultures, philosophy and history.