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Chad McKell

CONTACT

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EDUCATION

9/19–	Ph.D. Student, University of California San Diego , Computer Music <i>GPA: 4.0</i> . Coursework: acoustic modeling, computer graphics, digital signal processing. Research areas: acoustic simulation, computer graphics. Advisors: TBD.
9/16–10/17	M.S., University of Edinburgh , Acoustics and Music Technology <i>Graduated with merit</i> . Research area: acoustic simulation. Advisor: Stefan Bilbao.
8/09–12/15	M.S., Wake Forest University , Physics
6/02–8/09	B.S., Brigham Young University , Biophysics

ACADEMIC APPOINTMENTS

9/19–	University of California San Diego , Teaching Assistant/Researcher (Music)
9/12–12/12	University of North Carolina School of the Arts , Adjunct Instructor (Physics)
9/09–9/11	Wake Forest University , Teaching Assistant (Physics)
9/08–6/09	Brigham Young University , Tutorial Lab Assistant (Physics)
8/07–3/09	Brigham Young University , Research Assistant (Philosophy)

PROFESSIONAL EMPLOYMENT

7/18–7/19	Applied Research in Acoustics , R&D Scientist Culpeper, Virginia. Developed physics-based signal processing algorithms for naval sonar systems. Processed acoustic signals using methods such as matched filtering, sparse estimation, and beamforming. Researched sound propagation and reverberation.
10/14–8/16	J.P. Morgan/Neovest , Software Development Engineer in Test Orem, Utah. Developed Java-based automation software for J.P. Morgan's investment trading platform, Neovest. Created object-oriented unit tests to validate new features and locate software bugs.

CONSULTING

5/18–5/18	Moog Music : Audio effects development in C++ for digital and analog synthesizers.
4/17–9/17	Lofelt : Audio algorithm development and mathematical modeling for audio-haptic devices, including the Razer Nari Ultimate headsets.

ACADEMIC RESEARCH ACTIVITIES

- 1/20– **University of California San Diego**, Ph.D. Student
La Jolla, California. Research areas: *acoustic simulation*, *computer graphics*. Topics of interest include fluid dynamics, rigid body acoustics, and sound radiation. Simulation methods of interest include finite-element schemes, finite-difference schemes, modal synthesis, and machine learning.
- 1/17–8/17 **University of Edinburgh**, Master’s Student
Edinburgh, Scotland. Research area: *acoustic simulation*. Developed physics-based numerical simulations of speech and rigid body acoustics with Stefan Bilbao. Simulation methods included modal synthesis and finite-difference time-domain schemes.
- 1/10–9/13 **Wake Forest University**, Master’s Student
Winston-Salem, North Carolina. Research areas: *optics*, *condensed matter physics*. Achieved the first known realization of transverse particle tracking in surface-isolated laser traps with Keith Bonin. Study topics included laser beam characterization, fluid diffusion, polymer solutions, fluorescence microscopy, and particle tracking.
- 8/07–8/09 **Brigham Young University**, Undergraduate Student
Provo, Utah. Research area: *condensed matter physics*. Studied structural changes of biological materials exposed to isoflurane using atomic force microscopy.

PH.D. COURSEWORK

- CSE 167 Computer Graphics I (Jürgen Schulze)
CSE 168 Computer Graphics II—*audit* (Ravi Ramamoorthi) – **current**
CSE 169 Computer Animation—*audit* (Steve Rotenberg)
CSE 291 Physical Simulation—*audit* (Steve Rotenberg) – **current**
CSE 163 Advanced Computer Graphics—*audit* (TBD) – **planned: Q2 2022**
CSE 250A Artificial Intelligence I—*audit* (TBD) – **planned: Q4 2021**
CSE 250B Artificial Intelligence II—*audit* (TBD) – **planned: Q1 2022**
CSE 252A Computer Vision I—*audit* (TBD) – **planned: Q4 2021**
CSE 252B Computer Vision II—*audit* (TBD) – **planned: Q1 2022**
CSE 253 Neural Networks for Pattern Recognition—*audit* (TBD) – **planned: Q1 2022**
ECE 251A Digital Signal Processing I (TBD) – **planned: Q4 2020**
ECE 251B Digital Signal Processing II (TBD) – **planned: Q1 2021**
ECE 253 Digital Image Processing—*audit* – **planned: Q4 2021**
MATH 270A Numerical Linear Algebra—*audit* (TBD) – **planned: Q4 2021**
MATH 270B Numerical Approximation and Nonlinear Equations—*audit* (TBD) – **planned: Q1 2022**
MATH 270C Numerical Ordinary Differential Equations—*audit* (TBD) – **planned: Q2 2022**
MATH 272A Numerical Partial Differential Equations I—*audit* (Michael Holst) – **planned: Q4 2020**
MATH 272B Numerical Partial Differential Equations II—*audit* (Michael Holst) – **planned: Q1 2021**
MATH 272C Numerical Partial Differential Equations III—*audit* (Michael Holst)—**planned: Q2 2021**
MUS 270A Digital Audio Processing (Tamara Smyth)
MUS 270B Analysis of Musical Sound (Miller Puckette)
MUS 270C Compositional Algorithms (TBD) – **planned: Q1 2021**
MUS 270D Advanced Projects in Computer Music (Miller Puckette) – **current**
MUS 206 Deep Learning for Music Generation (Shlomo Dubnov) – **current**
MUS 206 Computational Acoustic Modeling (Tamara Smyth)
MUS 206 Pure Data Seminar (Miller Puckette) – **current**
MUS 298 Directed Research (Shlomo Dubnov)

TEACHING EXPERIENCE

UC San Diego

- MUS 5 Sound in Time (TA). Spring 2020 (1 quarter).
MUS 15 Interactive Music for Video Games (TA). Winter 2020 (1 quarter).

UNCSA

- SCI 1100 General Physics (Instructor). Fall 2012 (1 semester).

Wake Forest

- PHY 113 General Physics I (TA). 2009–2011 (4 semesters).

PUBLICATIONS

Journal Articles

- (1) **C. McKell** and K. Bonin, “Optical corral using a standing-wave Bessel beam,” *Journal of the Optical Society of America B*, Vol. 35, No. 8, 1910–1920, 2018.

Conference Proceedings

- (2) **C. McKell**, “Sonification of Optically-Ordered Brownian Motion,” In Proceedings of the International Computer Music Conference (ICMC), Utrecht, Netherlands, September 2016.

Master’s Theses

- (3) **C. McKell**, *Real-Time Physical Modeling for Haptic Feedback Rendering*, Final Project Dissertation, University of Edinburgh, Acoustics and Audio Group, 2017.
(4) **C. McKell**, *Finite-Difference Simulations of Speech with Wall Vibration Losses*, Special Project Dissertation, University of Edinburgh, Acoustics and Audio Group, 2017.
(5) **C. McKell**, *Confinement and Tracking of Brownian Particles in a Bessel Beam Standing Wave*, Master’s Thesis, Wake Forest University, Department of Physics, 2015.

Technical Reports

- (6) **C. McKell**, H. Conley, and D. Busath, “AFM Study of Structural Changes in Supported Planar DPPC Bilayers Containing General Anesthetic Isoflurane,” Brigham Young University, Paper 827, 2010.

Conference Abstracts

- (7) K. Bonin and **C. McKell**, “Tracking Brownian Particles in a Standing-Wave Bessel Beam 2D Optical Trap,” SPIE: Optical Trapping and Optical Micromanipulation, XIV Meeting, 2017.