RPI Graduate Program in Architectural Acoustics

NING XIANG
GRADUATE PROGRAM IN ARCHITECTURAL ACOUSTICS
SCHOOL OF ARCHITECTURE
RENSSELAER POLYTECHNIC INSTITUTE, TROY, NEW YORK

Sept. 3rd 2020, @ WebEx

Faculty / Adjunct

Jonas Braasch  Ning Xiang

Adjuncts: Jens Blauert; Wolfgang Ahnert

Graduate Degrees

Masters Degree: Architecture Science
   -- Architectural Acoustics:
      12 Month Graduate Program
Ph.D. Degree: Architecture Science
   -- Architectural Acoustics
   with education and research mission
Mission
Establish the global reputation for excellence in acoustics, accomplish this by:

- Constantly improving graduate pedagogy by integrating STEM methods
- Conducting high-impact research

Mission
- Continuing to present at national and international acoustics conferences
- Continuing to publish in the top peer-reviewed acoustics journals
- Creating and rewarding job opportunities for our graduates

MS Graduate Curricula

<table>
<thead>
<tr>
<th>F - Semester</th>
<th>S - Semester</th>
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<tbody>
<tr>
<td>Arch. Acoustics I, 4 cr.</td>
<td>Arch. Acoustics II, 4 cr.</td>
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<tr>
<td>Sonics Research Lab I, 3 cr.</td>
<td>Sonics Research Lab II, 2 cr.</td>
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<tr>
<td>Applied Psychoacoust, 3 cr.</td>
<td>Aural Architecture, 3 cr.</td>
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<tr>
<td>Engineering Acoustics, 3 cr.</td>
<td>Grad. Thesis Seminar, 1 cr.</td>
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Research Focuses

- Acoustics of performance venues
- Healthcare-acoustics
- Virtual environment technology
- Art, performance, aural architecture
- Psychophysics and auditory modeling
- Advanced acoustic sensing & data analysis

Graduate Students

Currently 5 M.S. and 6 Ph.D. students
1 new Ph.D. student in the pipeline
Over past 20 years: more than 150 M.S students,
15 Ph.D. students graduated
- Dr. Yun Jing, tenured Associate Professor
  at North Carolina State University
- Alex Case, Asso. Professor at Umass, Lowell, FASA,
  Chair of TCAA, current President of AES
- Dr. Summers, Dr. Henderson, entrepreneurs
- Many became principal / senior consultants

Ph.D. Graduates

Jason Summers
Paul Henderson
Bobby Gibbs
Jonathan Botts
Anthony Parks
Anne Guthrie
Torben Pastore
Daniel Valente
Yun Jing
Alex Bockman
Philip Robinson
Sam Clapp
Cameron Fackler
STEM Methods

High Resolution Goniometer

Graduate Students at Conferences
The Acoustical Society Meetings, twice/year
The Audio Engineering Society Conventions once/year (NYC / West Coast, SF, LA)
International Congress on Acoustics (3 years)
International Conference on Noise Control Engineering (InterNoise, annual)
Prestigious Awards


Prestigious Awards

Robert Bradford Newman Student Medal


Prestigious Awards

Leo Beranek Student Medal (2013)
Prestigious Awards

Leo Beranek Student Medal (2019)

Student Awards

Student Travel Award to Hawaii
Samuel Chabot, NCAC (2016)

Young Scientist Travel Award
Joy Hou, INCE (2017)

Students’ Career
Graduates’ Professional Career

- Acentech MA
- Arup (NYC)
- Acoust. Dimensions
- Cavanaugh Tocci
- JH Acoustics
- Shen Wilson and Wilke
- McKay Conant Hoover
- Threshold Acoustics
- Charles Salter Assoc.
- Kirkgaard Assoc.
- Merck & Hill Consult
- Talaske Group
- Eilar Associates
- CSTI acoustics
- ... ...

Meet Kelsey Hochgraf

Class 2014-2015

Career

Acoustic Career

Alex Case (MS 1999)
Asso. Prof. at UMass,
Former President AES

Dr. Yun Jing (Ph.D. 2009)
Asso. Prof. at NC State
University

Dr. E. Diekmann
(MS. 2010):
Asso. Prof. at Univ.
New Haven
Conference Presentations 2019

B. Loshin: Auditory/tactile perception of vibration/noise
S. Richie: Auditory/visual distance perception
M. Hoeft: Transparent multi-layer micro-slit absorber
M. Miller: Laser-Doppler vibrometry for bending waves
E. Scott: Hybrid room-acoustic simulations
K. Zaman: Quantify cognitive loads in noisy hospitals
A. Savino: High-resolution acoustic goniometer
S. Weikel: Bayesian localization via spherical microphone

Acoustics Conference 2017

Elected Fellows 2019
Newman Medalist 2019

Recent Journal Publications

D. Bush: Broadband coprime microphone array (JASA 2015)
E. Teret: Signal types on perceived reverberance (JASA 2017)
D. Beaton: Bayesian modal analysis (JASA 2017)
A. Alamuru: High-resolution room-scanning (JASAEL 2018)
T. Uday: Artificial reverberance (JASA 2019)
A. Rozynova: Physical theory of diffraction (JASA 2019)
C. Landschoot: Spherical microphone array (JASA 2019)
K. Ritchie: Bayesian porous materials (JASA, preparation)

Publications 2018 -2019

Journal papers: 12 JASA
34 conference papers presented
Research Area I

Virtual Technology
Art, Performance Aral Architecture

Auditory Modeling

(J. Braasch)

Interactive Telematic Virtual Environments
Auditory Models of Spatial Hearing

Virtual Reality, Immersive Learning, Data Perceptualization
Robotics, Cognitive Systems & Assistive Technologies

Research Area II

Modular Acoustic Diffusors
C. Schaefer (2007)

X-aerogel in nano-morphology
M. Miller (2019)
Advanced Modeling

Physical Theory of Diffraction
beyond Geometrical Acoustics
(A. Rozynova 2017)

Research Area III

In-Situ Measurement

Measurement Tools

Coprime Sensing
D. Bush (2015)

Coprime theory: M=9, N=8
Binaural / Spatial Analysis

32 channel spherical microphone

C. Landschoot (2018); S. Weikel (2019)

Acoustics in Healthcare

Speech privacy
Modeling methods
Acoustic materials
Measurement tools
Simulation medicine
Auditory comfort
Quantifying stress load

P. Dodds (2016); K. Zaman (2019)

Quantifying Working Memory

3-Back

Indicate three letters ago exactly, if the announced letter is a match (M) or not.

Hospital noise (Mt. Sanai)

P. Dodds (2016); K. Zaman (2019)
Your Research Project

Late Sept. early Oct.: Individual meeting
Research Design Seminar
179th ASA Meeting in Chicago: May 2020
- Student design competition
- Paper presentations

Thesis: Jun. – Aug. 2020 → Paper publication
InterNoise, 23-26 Aug. 2020 (abstracts Mar. 2020)

Concluding Remarks

One year study / research
- 22 credits curricula
- 3 credits seminars
- 5 credits research
Success in study
Excellence in research
Next career step

Acknowledgement

Thank You for Your Attention