

EDUCATION

Audiology, Post Doc

Walter Reed National Military Medical Center, Bethesda, MD /
(before August 2011: Walter Reed Army Medical Center, Washington, DC)

November 2010 – Present

Neuroscience of Vocal Communication, Post Doc

Indiana University, Bloomington, Indiana

March 2007 – October 2010

Neuroscience of Vocal Communication, Ph.D.

University of Southern Denmark, Odense, Denmark

February 2001 – July 2005

Animal orientation and Navigation, M.Sc.

University of Southern Denmark, Odense, Denmark

August 1996 – May 2000

Acoustic Communication, B.Sc.

University of Southern Denmark, Odense, Denmark

August 1993 – June 1996

Programming skills

MATLAB
Pascal/Delphi

Languages

English
German
Danish

PUBLICATIONS

Jensen, K. K. & Klokke, S. (2006) Hearing sensitivity and critical ratios of hooded crows (*Corvus corone cornix*). *Journal of the Acoustical Society of America* **119** (2) 1269 - 1276.

Jensen, K. K. (2007) Co-modulation detection differences in the hooded crow (*Corvus corone cornix*), with direct comparison to human subjects. *Journal of the Acoustical Society of America* **121** (3) 1783 - 1789.

Jensen, K. K., Cooper, B. G., Larsen, O. N., & Goller, F. (2007) Songbirds use pulse tone register in two voices to generate low-frequency sound. *Proceedings of the Royal Society B*, **274** (1626) 2703 - 2710.

Jensen, K. K., Larsen, O. N., & Attenborough, K. (2008) Measurements and predictions of hooded crow (*Corvus corone cornix*) call propagation over open field habitats. *Journal of the Acoustical Society of America*, **123** (1) 507 - 518

Jensen, K. K. (2010) Light-dependent orientation responses in animals can be explained by a model of compass cue integration. *Journal of Theoretical Biology*. doi:10.1016/j.jtbi.2009.09.005.

Talks

Invited talk: Jensen, K. K. (2012) A model of multimodal compass-cue integration to explain complex orientation responses to monochromatic light. *IVth European Conference on Behavioural Biology, Essen, Germany, July 19-22*.

Jensen, K. K., Bernstein, J. G. W. (2012) Modeling speech perception in competing speech and speech. Talk given at the *American Auditory Society Annual Meeting March 8-10, 2012 Scottsdale, Arizona, USA*.

ABSTRACTS

- Jensen, K. K.**, Christensen-Dalsgaard, C., Suthers, R. A., & Larsen, O. N. (2010) A newly discovered superoanterior-orbital sinus connecting to the interaural canal may play a role in zebra finch hearing. *9th International Congress of Neuroethology, Salamanca, Spain, August 2nd - August 7th*.
- Riede, T., **Jensen, K. K.**, Larsen, O. N., Attenborough, K., & Shahram, T. (2010) Habitat acoustics of Rocky Mountain elk in Colorado and European Red deer in Denmark. *The 90th Annual Meeting of the American Society of Mammalogists, Laramie, USA, June 11th - June 15th*.
- Riede, T., **Jensen, K. K.**, Larsen, O. N., Attenborough, K., & Shahram, T. (2010) Habitat acoustics of Rocky Mountain elk in Colorado and European Red deer in Denmark. *Rocky Mountain National Park 2010 Research Conference, Estes park, Colorado, USA. March 30th - March 31st*.
- Jensen, K. K.** & Suthers, R. A. (2008) Real-time compensation for formant changes by beak gape in a songbird. *Acoustic Communication by Animals, Corvallis, Oregon, USA*.
- Jensen, K. K.**, Zollinger, S., Childress, S., Larsen, O. N., & Suthers, R. A. (2008) Anatomy and vibratory dynamics in the songbird syrinx. *Acoustic Communication by Animals, Corvallis, Oregon, USA*.
- Jensen, K. K.**, Larsen, O. N. & Attenborough, K. (2007) Modeling and measuring sound propagation of hooded crow calls in open field habitats. International Ethology Conference, Halifax, Nova Scotia, Canada.
- Larsen ON, **Jensen K. K.** and Goller F (2006): Pulse register phonation in crows revealed with high-speed video endoscopy. *Proceedings of the 5th International Conference on Voice Physiology and Biomechanics, Tokyo, Japan* p. 127-128.
- Jensen, K. K.** & Klokke, S. (2004) Hearing threshold and critical ratios in hooded crows (*Corvus corone cornix*). *7th congress of the international society for neuroethology (ICN), Nyborg, Denmark*.
- Larsen, O. N., **Jensen, K. K.**, & Goller, F. (2004) High-speed video recording of labial movement during bird phonation. *7th congress of the international society for neuroethology (ICN), Nyborg, Denmark*.
- Jensen, K. K.** (2000) Redstarts (*Phoenicurus phoenicurus*) seem able to orient by the magnetic field under red light. *28th Göttingen Neurobiology Conference, Göttingen, Germany*.

TEACHING

- *Extensive teaching experience (more than 250 class room hours): among several other classes responsible as instructor to give lectures and run lab practicals in graduate course in Hearing and Sound Perception in Humans.*
- *Responsible for designing written exam and proctoring oral and written exams.*
- *Responsible for plenum lecturing, writing compendium, and designing lab practicals for more than 200 students in undergraduate course.*

GRANTS

Competitive research grant (2009) awarded by a foundation belonging to the hearing aid company Oticon, Smørum, Denmark.

Competitive research grant (2007) awarded by the Carlsberg Foundation, Copenhagen, Denmark.

RESEARCH EXPERIENCE

Speech perception by human listeners

November 2010 – Present

Audiology and Speech Center, Walter Reed National Military Medical Center, MD, USA

Modeling of speech perception in fluctuating maskers: Research in why speech intelligibility index models specifically fail to predict speech intelligibility in speech related maskers like interfering talkers or speech envelope modulated noise. Psychoacoustic tests on normal hearing listeners on the possible effect of the dynamic range of speech and modulation rate.

Implementing modifications to speech intelligibility models: Based on the above we are working on implementing a modification of speech intelligibility models by incorporating a factor that takes into account a “picket fence” effect where speech intelligibility at slow masker modulation rates depends on the probability of detecting a snippet of all phonemes of target words.

Research in hearing and vocal communication

March 2007 – October 2010

School of Medicine, Indiana University, Bloomington, IN, USA

Auditory feedback: Research in the control of vocal formants (analogue to human speech formants) by auditory feedback in a songbird. Performed x-ray cinematography and video movement analysis. Results showed songbirds control formants actively by auditory feedback and responded in a similar way to humans.

Directional hearing: Discovery of a hollow structure that interconnects to the inter-aural canal in birds that is likely to facilitate directional hearing. Laser vibrometry measurements of acoustic effect. MRI scanning for 3D reconstruction of structures.

Vocal production: X-ray cinematographical research into the use of oral cavities in sound modulation during vocal production. Research into the specific anatomy and oscillation dynamics of sound producing labia in songbirds analogous to human vocal folds.

Directional Hearing, Post Doc

April 2009 – December 2009

Indiana University, Bloomington, Indiana, &

Grant awarded by Oticon

University of Southern Denmark, Odense, Denmark

Discovery of an air filled cavity in the skull of birds connected to the inner ear which may play an important role in directional hearing. Experiments involve 3D reconstruction of inter-aural cavities. Acoustic systems modeling in collaboration with professor in physics Neville Fletcher, University of New England, Canberra, Australia. Laser vibrometry measurements of eardrum vibrations. Histology.

Computational Neuroscience, Animal Navigation and Orientation

2007 – 2010

Independent research

Formulation of theoretical and computational model of neural integration to explain the hot research topic of the mysterious and intriguing effect of light on the magnetic sense of navigating animals. Well-received and complimented by significant peers: *“This is the most creative piece of work I've seen in a while, and gives the animal navigation community a new way of thinking about a thorny problem...has great explanatory power... Frankly, I wish I had come up with the idea!”* [Anonymous reviewer]; *“... a new and really very useful model to possibly understand bird magnetic orientation... a clever idea that should be followed up...”* [Professor Almut Kelber]; *“...fascinating and highly provocative paper!...”* [Professor Uwe

Homberg]; “...an *interesting and thought provoking contribution to the debate concerning the mechanism(s) of magnetoreception in higher animal...*” [Professor John Philips].

Comparative psychoacoustics

October 2003 – November 2003

Psychology Department, University of Maryland, College Park, MD, USA

Collaboration with renowned Professor Robert Dooling conducting research into a potential effect of *lowering hearing thresholds of speech-like harmonic complexes by amplitude (AM) and frequency modulation (FM)*. Conducted on zebra finches which are important animal models in comparative research of human hearing, speech, and vocal learning.

Acoustic Communication

February 2004 – July 2005

Institute of Biology, University of Southern Denmark, Odense, Denmark.

Psychoacoustic research: Engineered a psychoacoustic test system from scratch for comparative tests of hearing in crows and humans. Programmed DSP equipment (Tucker Davis) for stimuli generation and control, and programmed custom software (Delphi/Object Pascal) to run the sessions and collect data automatically. Required study and implementation of Signal Detection Theory.

Vocal production: Angiocopic high-speed filming of sound production mechanism in vocal organ of crows (similar to human speech production). Contributed significantly to development of experimental technique for high speed recording by proving laser light through optic fibers and video enhancement.

Vocal signal propagation: Modeling of crow call propagation and hearing in the natural noisy environment. Combined engineer sound propagation modeling with hearing and vocal production research.

Acoustic brain stem responses (ABR): testing of crow hearing with ABR technique in collaboration with Dr. Beth Brittan-Powell, University of Maryland, MD, USA.

REFERENCES

1. Dr. Joshua G. W. Bernstein, Audiology and Speech Center, Walter Reed National Military Medical Center, 8901 Wisconsin Avenue, Bethesda, MD 20889, USA (joshua.bernstein@med.navy.mil).
2. Prof. Roderick A. Suthers, Indiana University, School of Medicine, Jordan Hall, 1001 East Third Street, Bloomington, IN 47405, USA (suthers@indiana.edu).
3. Prof. Robert J. Dooling, Laboratory of Comparative Psychoacoustics, Department of Psychology, University of Maryland, College Park, MD 20742, USA. (dooling@psyc.umd.edu).
4. Dr. Ole Næsbye Larsen, Institute of Biology, University of Southern Denmark, Campusvej 55, DK-5230 Odense M, Denmark. (onl@biology.sdu.dk).