Speech, Language, and Hearing Sciences

Discovery with delivery as WE BUILD OUR FUTURE
SLHS celebrates 75 years at Purdue since its beginning in the basement of University Hall.

It began with Dr. Mack Steer.....
The SLP Masters Program is ranked 2nd and the Doctor of Audiology Program is ranked 9th (U.S. News and World Report)

* Doctoral programs/faculty productive
  - Ranked 3rd – Academic Analytics

* Clinics
  - Over 4,000 patients seen per year in clinics served by SLHS graduate students and clinical faculty (15) and staff (2).
“Discovery”
Research – Examples
$\sim \frac{1}{2}$
The Cocktail Party Problem: How do we hear the speech we want to hear when other speech interferes?

Dr. Alexander L. Francis

• What role is played by basic cognitive mechanisms?
  – Working Memory
  – Selective Attention
  – Executive Control
Experimental Amplification Research Lab

Dr. Joshua M. Alexander

- Discovery of innovative sound processing techniques for delivery in hearing aids to improve speech understanding
Enhancing speech recognition for cochlear implant users

Dr. Xin Lou

- **Pre-processing of Input Speech**
  - Original speech with increasing tone
  - Envelope enhanced speech

- **Transmission Coil**
  - Speech Processor
  - Electrode Array

- **Perceptual Training Paradigms**
  - Sentence in quiet
  - Sentence in noise

- **Combining Electric and Acoustic Hearing**
  - For patients with residual low-frequency acoustic hearing, hearing aid can be used together with cochlear implant to enhance speech recognition in noise

- **Advanced Pitch Coding Strategies**
  - Identification of pitch contours created by current steering
  - When current is “steered” between simultaneously stimulated adjacent electrodes (with different $\alpha$), CI users perceive distinctive intermediate pitch
Why are some individuals susceptible to voice disorders?

Up to 9% of Americans have voice disorders.

Treatment of voice disorders costs millions of dollars annually.
Goal: To develop a wearable device to treat speech problems experienced by individuals with Parkinson’s Disease

“The loss of the ability to communicate is one of the biggest losses as a result of Parkinson’s disease.” (patient pictured)
Effects of cochlear implant experience on young deaf children’s speech and language development
Dr. David Ertmer
Infant Speech Perception Lab
Dr. Amanda Seidl
Augmentative and Alternative Communication (AAC) / Autism Spectrum Disorders (ASD)

Dr. Oliver Wendt

Efficacy of AAC and Assistive Technology for developmental disabilities
Verb comprehension involves mentally simulating what it is like to perform the designated actions.

Dr. David Kemmerer
Neural Systems for Language Processing
Dr. Chris Weber-Fox

Helping to identify the children who are most at risk for developing persistent stuttering.
Study of the effect of increasing language complexity on speech motor control in typical development and stuttering – predictions for recovery and persistence

Dr. Anne Smith
“Delivery”
SLHS Clinics
Speech and Language Clinics

Serving
• M.D. Steer Campus Clinics
• Clarian/Arnett Hospital & Clinics
• Lafayette Otolaryngology
  (Drs Berner & Hillsamer)
• Preschool Language Lab
  Program – Morton Center

Annual Statistics
Total client visit >2000
340 Clients
180 Consultations
324 Clinical Research Subjects
Audiology Clinics

- Serving > 15 Indiana counties
- Only Audiology diagnostic provider for birth to three population in Tippecanoe and surrounding counties
- One of only 17 facilities statewide equipped to provide comprehensive infant assessments
- Serving the underserved through the Lions Club and Riggs Community Health Clinic

Annual Statistics:
- Total patient visits > 2000
- Pediatric patient visits ~ 500
- Adult patient visits ~ 1500
- Hearing aids dispensed ~ 100