

# Developing Video Games for Medical Diagnostics



**Dennis Barbour**  
Associate Professor, Biomedical Engineering

## CURRENT RESEARCH

### Using video games to diagnose and treat hearing and listening difficulties


How did we originally learn to understand the speech of others? It took years of training. If our ears start failing, our hearing can be corrected by hearing aids, but our listening ability needs to be retrained for the new sounds. Accurate diagnosis is essential to help understand the type of assistance needed. Properly designed video games based on scientific principles can provide diagnostic tools as well as training opportunities for new hearing aid recipients.

Dr. Dennis Barbour at Washington University in St. Louis believes that video games have a potential that far surpasses entertainment value. Dr. Barbour is designing portable video games constructed from auditory tasks handled differently by individuals with hearing difficulties compared to individuals with listening difficulties. Hearing difficulties can be treated with hearing aids, but listening difficulties require training or other therapy. Currently, diagnosis is imprecise, inconvenient and costly because it requires multiple batteries of tests delivered by experts using specialized equipment. Additionally, some of the technology and techniques used for this process are decades old. Dr. Barbour believes that his novel video games will be useful for anyone who has trouble following a conversation, initially to determine the likely effectiveness of a hearing aid and later for therapeutic purposes.

- Dr. Barbour is at the start of this newly developing project and hopes to begin collecting data this summer to begin evaluating his games accuracy of diagnoses.
- He has software development currently underway and multiple games have been designed and are in various stages of coding...

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## AFFILIATION

 Washington University

## EDUCATION

- Ph.D. in Biomedical Engineering 2003 , Johns Hopkins University
- M.D. in Johns Hopkins School of Medicine 2003 , Johns Hopkins University
- B.E.E. in Electrical and Computer Engineering 1995 , Georgia Institute of Technology

## AWARDS

- Center for Integration of Medicine and Innovative Technology Primary Healthcare Prize Finalist
- Biomedical Engineering Chairman's Award for Excellence in Teaching
- Inaugural Washington University Chancellor's Award for Outstanding Contributions to Undergraduate Research
- Inaugural Washington University Dean's Award for Excellence in Teaching
- Washington University Center for Aging Pilot Project Award

## RESEARCH AREAS

Life Science, Health IT, IOT, Devices, Data, Veteran's Causes

## FUNDING REQUEST

Your contributions will help Dr. Barbour gain access to first-class programmers to build his medical diagnostic video games because real-time audio coding on smartphones and tablets is quite challenging, especially for games. The majority of raised funds will go towards software development, both in-house and by subcontract with professional game designers. Eventually the games will be distributed freely online and Big Data analytics will be used to understand the resulting trends.