

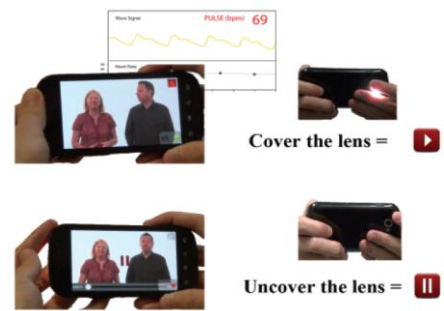
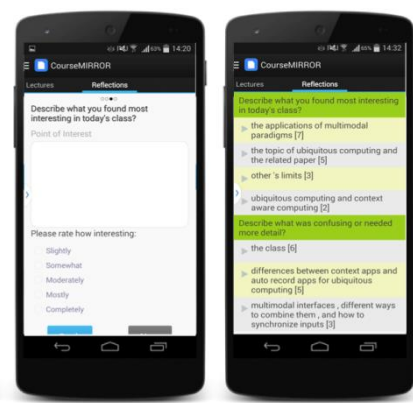


The Future of Mobile Learning

Jingtao Wang

Department of Computer Science
Learning Research and Development Center
University of Pittsburgh

<http://mips.lrdc.pitt.edu>



MOBILE INTERFACES AND PEDAGOGICAL SYSTEMS GROUP

Department of Computer Science, Learning Research and Development Center, University of Pittsburgh

COURSEMIRROR HOMEPAGE AND MOBILE APP

CourseMIRROR Improves STEM Education via Natural Language Processing (NLP), Visualization, and Mobile Interfaces. Android Apps, Web apps optimized for PCs and major mobile OSes are available for free download.

[GO TO COURSEMIRROR HOMEPAGE](#)

RECENT NEWS



Our paper on LivePulse Games has been accepted by ACM CHI 2015. Congratulations to Teng, Xiang, and Lanfei!

- ACM CHI 2015



Our paper on AttentiveLearner has been accepted by AIED 2015. Congratulations to Phuong!

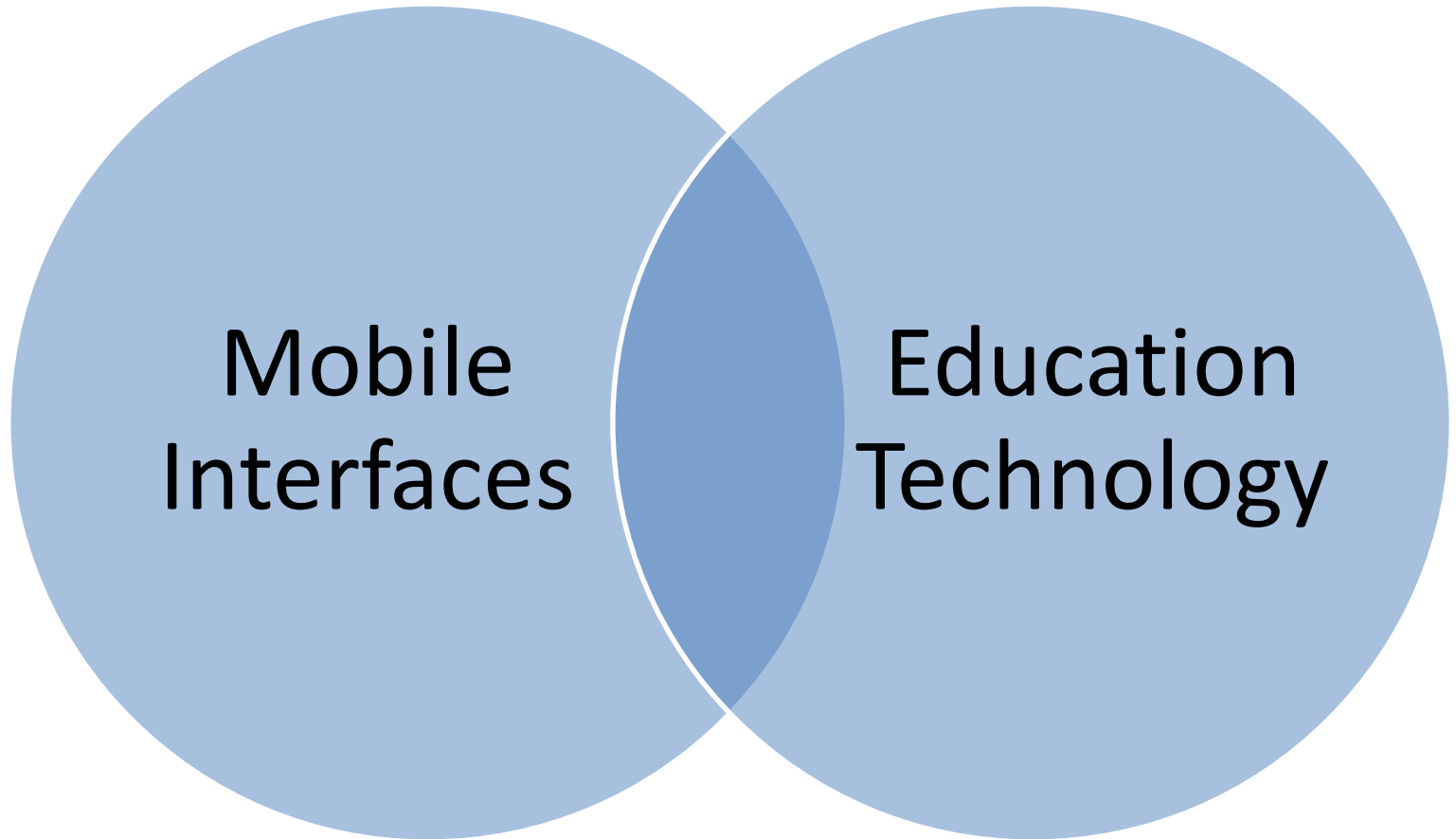
- AIED 2015



Mobile In-Situ Reflections and Review with Optimized Rubrics



My Research Interests



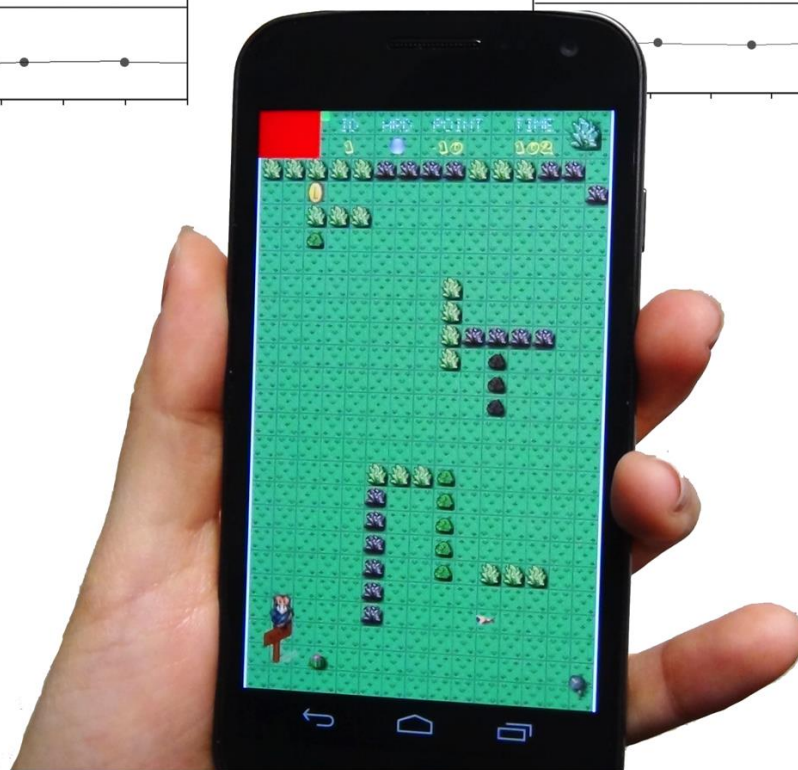
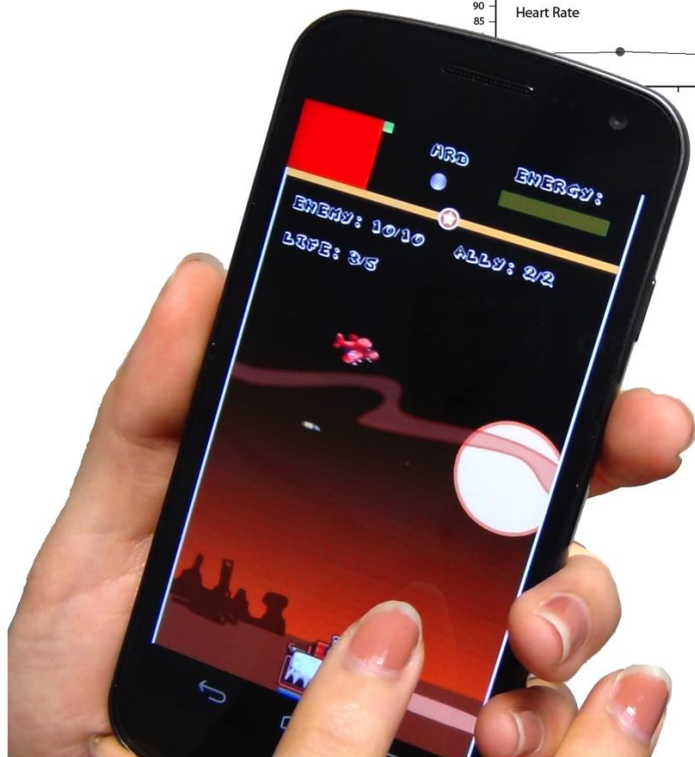
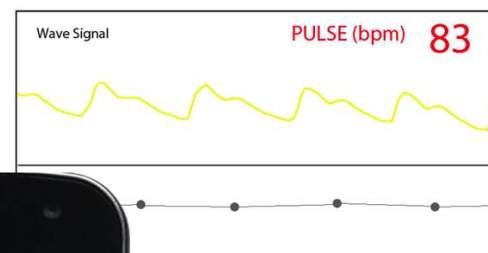
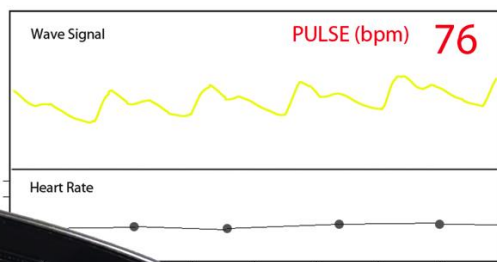
Previous & Current Undergraduate Researchers

- Andrew Head (ToneWars & e-Chimera)
 - Ph.D. student in UC Berkeley
- Jesse Thomason (ScatterDice Mobile)
 - Ph.D. student in U Texas Austin
- John Selker (6DOF Docking on Mobile Devices)
 - IBM Pittsburgh
- Yunxin Liu (LivePulse)
 - Amazon.com
- Vincent Tran (Kanji Tutor)
 - Amazon.com
- Gangzheng Tong & Zac Yu (CourseMIRROR)

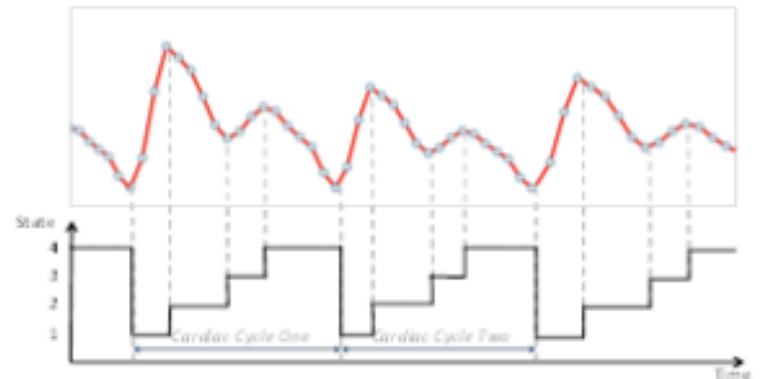
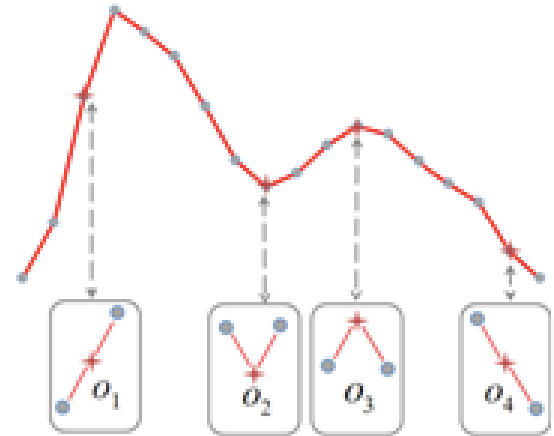
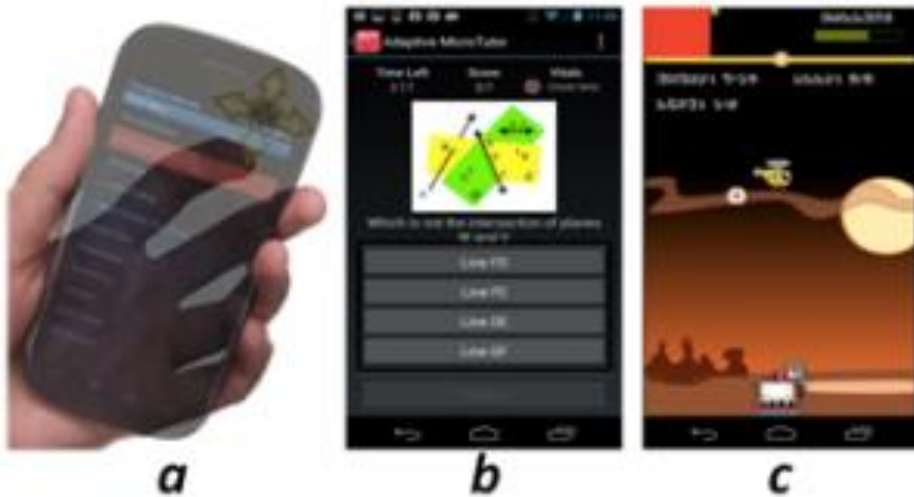
LensGesture: Back-of-Device On-Lens Finger Gestures



LivePulse Games: Implicit Heart Rate Tracking via Mobile Game Play

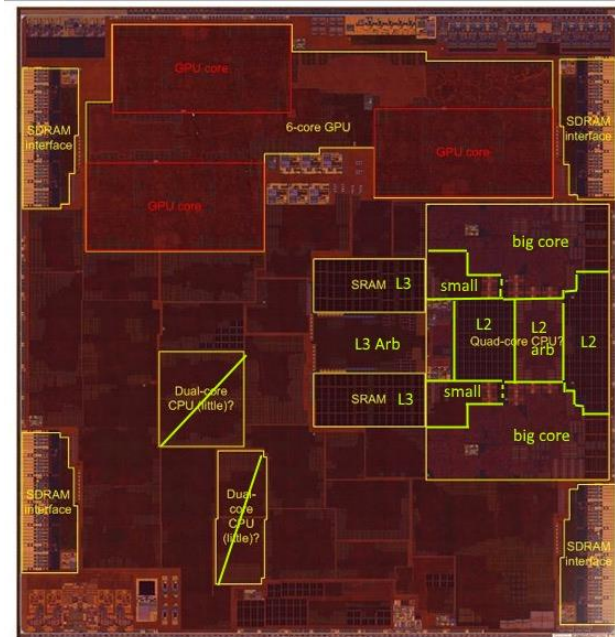


BayesHeart: A Probabilistic Approach to Extract Heart Rates from Noisy, Intermittent Signals



The Challenges and Opportunities in Mobile Computing

Apple iPhone 7 in 2016



~ 210 GFLOPS

Intel Paragon XP/S 140 Sandia National Laboratories 1993

The phone in your pocket may be faster than the supercomputer in 1993

~ 143 GFLOPS



Clifford Mass

Professor of Atmospheric Sciences

University of Washington

<http://www.atmos.washington.edu/mass.html>

Atmospheric Sciences 101 Math Assessment

This is only for helping me design the homeworks/quizzes. NO CALCULATORS. No name needed.

Your High School _____ City and State of your HS _____

1. Arithmetic

(a) $\frac{1}{0.1} =$

(b) $2^3 =$

(c) $64^{1/2} =$

(d) $2^{-2} =$

(e) $\frac{25 \cdot 10^3}{5 \cdot 10^{-5}} =$

(f) $231/7 =$ (no calculator, to the tenths place)

2. Express in scientific notation

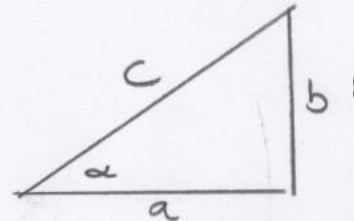
(a) .00012

(b) 300,000

3. Geometry and Trigonometry

(a) The formula for the area of a circle is:

(b) Using the diagram at the right, $\cos \alpha =$
a/b, b/a, a/c, d/a. b/c, c/b (circle the right answer)



4. Algebra

(a) $PV = nRT$; solve for T.

(b) $y = x/(1-x)$; solve for x

(c) $a/x = b/c$; solve for x in terms of a, b, c

Atmospheric Sciences 101 Math Assessment

This is only for helping me design the homeworks/quizzes. NO CALCULATORS. No name needed.

Your High School _____ City and State of your HS _____

1. Arithmetic

(a) $\frac{1}{0.1} = 10$ 74%

(b) $2^3 = 8$ 91%

(c) $64^{1/2} = 8$ 64%

(d) $2^{-2} = 1/4$ 48%

(e) $\frac{25 \times 10^3}{5 \times 10^{-5}} = 5 \times 10^8$ 25%

(f) $231/7 =$ (no calculator, to the tenths place) 33 57%

2. Express in scientific notation

(a) .00012 1.2×10^{-4} 58%

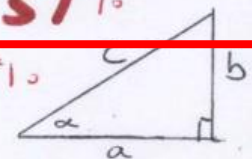
(b) 300,000 3×10^5 70%

3. Geometry and Trigonometry

(a) The formula for the area of a circle is: πr^2 57%

(b) Using the diagram at the right, $\cos \alpha =$ 53%

a/b, b/a, a/c, b/c, c/b (circle the right answer)



4. Algebra

(a) $PV = nRT$; solve for T. $\frac{PV}{nR} = T$ 87%

(b) $y = x/(1-x)$; solve for x
 $y(1-x) = x$
 $y - xy = x$
 $y = x + xy$
 $y - x(y+1)$
 $x = \frac{y}{y+1}$
 14%

(c) $a/x = b/c$; solve for x in terms of a, b, c
 $\frac{a}{x} = \frac{b}{c}$
 $ac = bx$
 $\frac{ac}{b} = x$ 51%

58%
Overall
 202 students

- 25% Fresh
- 29% Soph
- 21% Jun
- 18% Senior
- 6% Other

Can we use the “**supercomputer in our pockets**” to learn more effectively?

Opportunities in Next Generation Mobile Learning



Learning in Large Classrooms



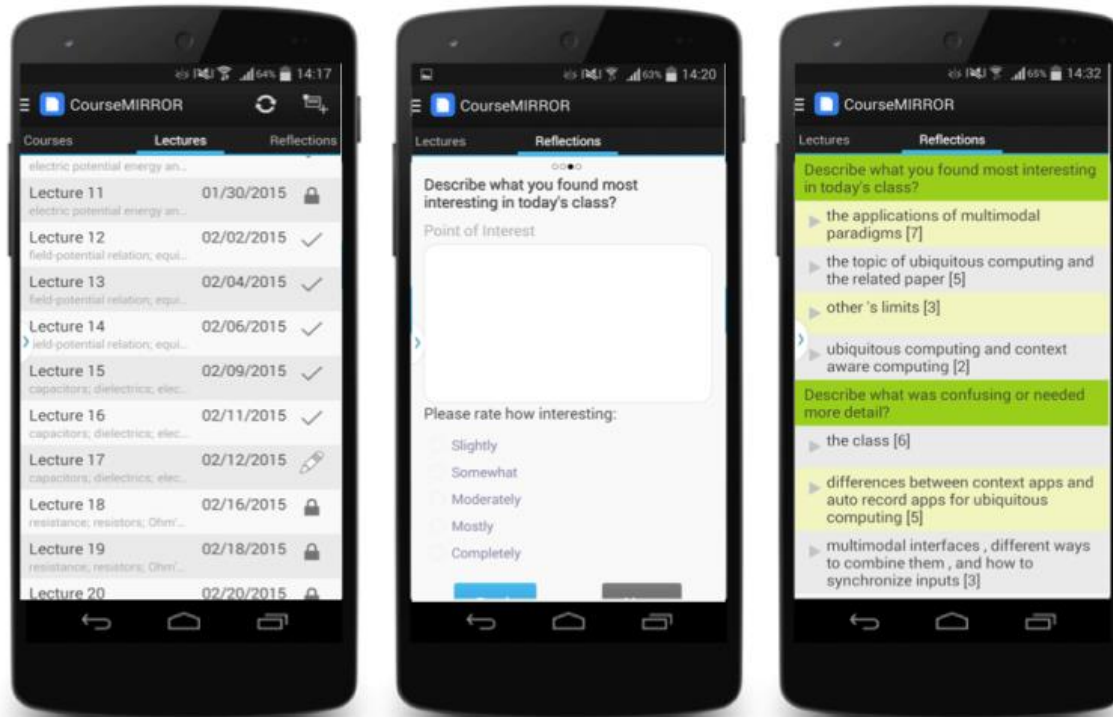
Informal Learning



MOOC Learning



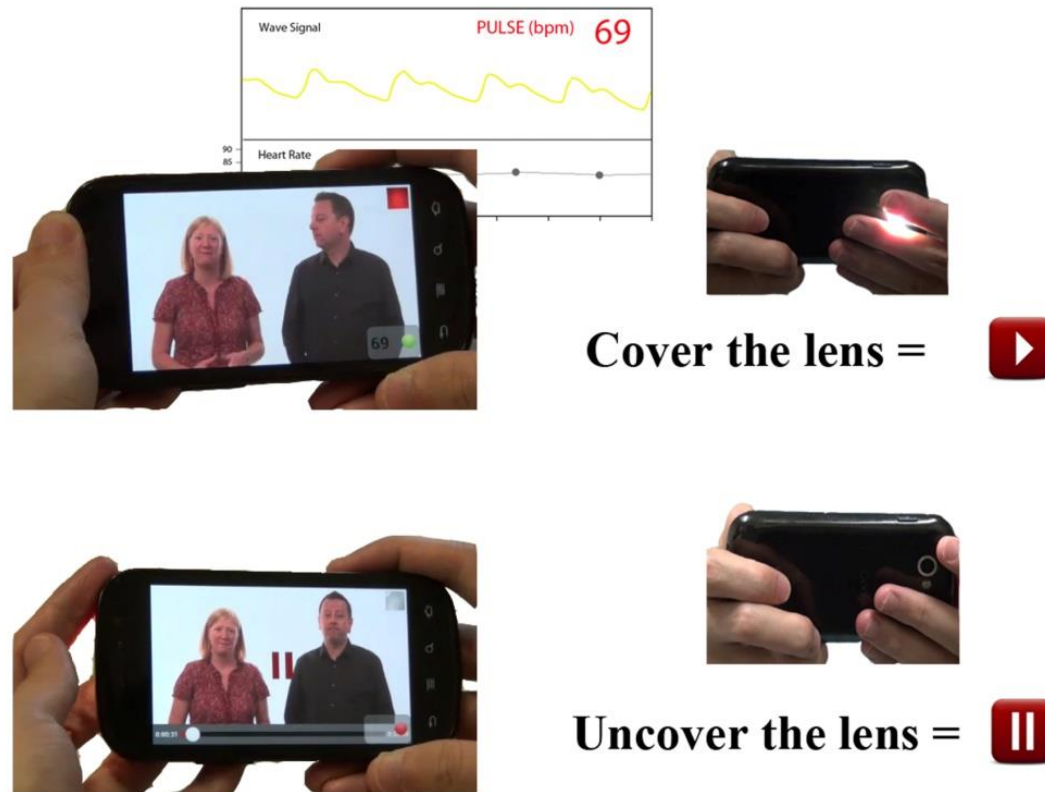
Scalable Reflection Prompts via Mobile Interfaces and Natural Language Processing



ToneWars: Connecting Language Learners and Native Speakers through Collaborative Mobile Games



AttentiveLearner: Improving Mobile MOOC Learning via Implicit Physiological Signal Sensing



Contact Methods

- Email: jingtaow@cs.pitt.edu
- Office Hours
 - 1:30PM – 2:30PM Tuesday, Thursday
 - SENNSQ 5423

The screenshot shows the MIPS Research website homepage. At the top left, it says "MIPS RESEARCH" with the subtitle "Mobile Interfaces and Pedagogical Systems Group". To the right is a navigation menu with links for "HOME", "TEACHING", "PUBLICATIONS", "PROJECTS", and "PEOPLE", followed by a search icon. Below this is a green banner with the text "MOBILE INTERFACES AND PEDAGOGICAL SYSTEMS GROUP" and "Department of Computer Science, Learning Research and Development Center, University of Pittsburgh".

The main content area features a section titled "COURSEMIRROR HOMEPAGE AND MOBILE APP" with a description: "CourseMIRROR Improves STEM Education via Natural Language Processing (NLP), Visualization, and Mobile Interfaces. Android Apps, Web apps optimized for PCs and major mobile OSes are available for free download." A green button labeled "GO TO COURSEMIRROR HOMEPAGE" is positioned to the right.

Below this is a "RECENT NEWS" section with two items:

- On the left, a news item with a smartphone icon: "Our paper on LivePulse Games has been accepted by ACM CHI 2015. Congratulations to Teng, Xiang, and Lanfei! - ACM CHI 2015".
- On the right, a news item with a group photo icon: "Our paper on AttentiveLearner has been accepted by AIED 2015. Congratulations to Phuong! - AIED 2015".

At the bottom, there is a row of six small images showing various mobile and web interfaces. Below this row is a dark blue footer bar containing the URL "http://mips.lrdc.pitt.edu" in white text.