



## WHAT IS THE MARYLAND BLENDED REALITY CENTER (MBRC)?

The Maryland Blended Reality Center is dedicated to advancing visual computing for healthcare and innovative training for professionals in high-impact areas. We're a partnership between University of Maryland, College Park (UMCP), University of Maryland, Baltimore (UMB) and University of Maryland Medical System (UMMS). Funded by The University of Maryland Strategic Partnership: MPowering the State, our Center's principals are:

- The R Adams Cowley Shock Trauma Center (STC) in Baltimore, with co-director Sarah Murthi, M.D. (Associate Professor of Surgery), and
- College of Computer, Mathematics & Natural Sciences (CMNS) in College Park, with co-director Amitabh Varshney, Ph.D. (Dean, CMNS and Professor of Computer Science).

## WHAT DOES MBRC DO?

We strive to improve the lives of Marylanders by:

- Developing augmented and virtual reality (AR and VR) technology for medical applications
- Fostering the growing technology industry in Maryland, making our state the center for AR and VR innovation
- Forming a national model for collaboration between healthcare and computer scientists, with impacts in medicine/health care, law enforcement, education, and the military

## WHO BENEFITS FROM OUR WORK?

- Patients: our immediate and direct beneficiaries are patients being treated at R Adams Cowley Shock Trauma Center, in the UMMS, and across the state of Maryland
- U.S. military: our applications can be adapted for field/combat use
- All Americans: our basic technology will impact multiple aspects of medicine, training and education, and fields far beyond

## HOW WILL MBRC ACHIEVE ITS GOALS?

Across four high-impact research thrust areas (critical-care patient diagnostics, human anatomy education, non-opioid pain management and training to combat implicit bias), we will:

- Combine collaborative, innovative projects with high-quality clinical research
- Publish manuscripts broadly and raise awareness nationwide about the uses for AR and VR in medicine and other fields

## WHAT ASSOCIATED COLLABORATIONS WILL BE ESTABLISHED?

- CENTER FOR PERFORMANCE AND INNOVATION, goal to improve trauma care through better data collection and analysis
- SHOCK TRAUMA PAIN PROJECT, goal to reduce to zero the number of patients who become addicted to opioids as a result of trauma

## HOW CAN YOU HELP?

While funding has been secured for infrastructure and pilot research, we are looking for collaboration and support to achieve our goals through:

- Advocacy
- Funding insights and opportunities
- Prospect identification

**[mbrc.umd.edu](http://mbrc.umd.edu)**

Contact: [info@mbrc.umd.edu](mailto:info@mbrc.umd.edu) 301.405.5014

# MARYLAND BLENDED REALITY CENTER



## MBRC: FOUR RESEARCH THRUSTS

*The Maryland Blended Reality Center brings the unique tools of augmented and virtual reality (AR and VR) to bear on four high-impact areas.*

### Critical-care patient diagnostics

**PROBLEM:** *Currently, health care providers have to look away from patients to see medical imaging displayed on a distant screen.*

**SOLUTION:** Our team has collaboratively carried out pilot studies to integrate ultrasound with AR headsets; our next step is to deploy the prototype in the field.

**OUTCOME:** **We're enabling safer performance of high-risk medical interventions.**

### Human anatomy education for healthcare providers, patients, and athletes

**PROBLEM:** *Right now, only new medical students get in-depth exposure to human gross anatomy.*

**SOLUTION:** We are creating a series of interactive blended reality (AR/VR) modules designed to teach and experience human anatomy immersively; these environments will provide real anatomy learning away from the dissection lab or to learners unable to participate in hands-on training.

**OUTCOME:** **We're creating and defining the next classroom experience.**

### Non-opioid pain management

**PROBLEM:** *Over-prescription of opioids to treat acute pain is a significant and tragic contributor to a nationwide epidemic.*

**SOLUTION:** We are developing immersive environments and studying their effect on reducing opiate and benzodiazepine use in athletic and traumatic injury; these environments show promise in lessening the perception of pain and decreasing the need for opioids during procedures.

**OUTCOME:** **We're validating safer, better ways of alleviating pain; these transfer to military and field applications.**

### Training to combat implicit bias and reduce violence

**PROBLEM:** *Relationships between law enforcement and communities are fractured by a lack of empathy and situational understanding on all sides.*

**SOLUTION:** Our team is adapting virtual environments for better understanding of and intervention around implicit bias and conflict resolution, developing new tools that law enforcement agencies in particular can use to improve training on these issues.

**OUTCOME:** **We're supporting common experiences and better understanding to reduce violence in our community.**