



Featured Inventors: Charles Jonassaint, PhD, MHS; Nema Rao, MDes

## EXPRESSIVE PAINIMATION

*Changing the Health Care Landscape with a Novel Technology-based Approach to Pain Assessment*

### Value Proposition

For patients and providers who want a simple and engaging method for communicating, diagnosing and treating pain. Expressive Painimation is a novel technology-based pain assessment tool that uses abstract animations, rather than words or numeric scales, to help patients communicate their pain experience and provide clinicians the needed information to accurately diagnose and treat pain symptoms. Unlike the traditional 0-10 pain scale and paper-pencil pain assessments, Painimation allows patients to express the dynamic nature of their pain symptoms without the limitations of varying literacy levels, languages or cultures, takes less time complete and is engaging for all age-levels, children and adults.

### Market Opportunity

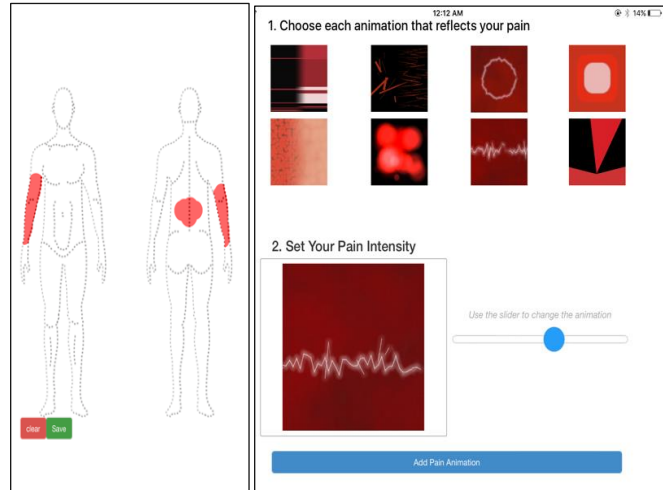
Pain is the #1 reason for medical visits in the U.S. **Clinicians** need tools for accurately assessing and diagnosing pain so that they can prescribe the correct treatment approach. **Patients** have a need to communicate their pain experience to providers and to accurately track their pain symptoms over time. Patients who have recently undergone a medical procedure or who have a chronic condition, want to be able to diagnose their pain symptoms at home so that they know whether their symptoms require a medical visit or can be treated at home. Finally, **clinical researchers** need patient reported outcomes measures that are accurate, engaging and are not burdensome.

### Competitive Landscape

There have been no innovations in pain assessment tools for the past 50 years. Current pain assessments are either one-dimensional (e.g. 0-10 scale) inaccurate or take too long to complete, and they rely on word descriptors and phrases that alienate patients of low education/literacy levels or different languages/cultures.

### IP Landscape

*Invention Disclosure Submitted 8/31/15*  
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Expressive Painimation Tablet Version Screen Shots

### Technology

Through a human-centered design study, we designed a novel, electronic, clinical pain assessment tool utilizes a time-based medium—animation—that can be calibrated by patients to express the dynamic and multidimensional aspects of their pain experience. Patients are provided with a selection of animations, shown on a tablet, that they use to describe the location and quality of their pain (Figure 1). The animations can be increased or decreased in speed, color saturation, focus and size, to reflect the intensity of their pain.

### Stage of Development

We have had initial success using Painimation among 207 patients with a variety of non-cancer pain conditions (e.g., headache, back pain, arthritis). Our preliminary study found that patients who reported pain due to nerve damage were more likely to select the animations indicative of “shooting” and “electricity” type pain. Further, Painimation was not only correlated with PainDetect, a well-validated measure of nerve damage type pain, but also showed better specificity in predicting patient-reported nerve damage. These preliminary findings were encouraging; however, in future applications we are seeking to improve the specificity and sensitivity of the measures by tailoring the tool for a specific health condition—cancer-related pain.

### Funding

\$25k through the Virginia Kaufmann Endowment awarded by the University of Pittsburgh CTSI

# FEATURED INVENTORS:

## *Charles Jonassaint, PhD MHS*

Assistant Professor of Medicine, University of Pittsburgh, is a clinical psychologist whose work focuses on behavioral intervention technologies for improving chronic disease care. Dr. Jonassaint has extensive experience working with chronic pain patients and in the delivery of behavioral treatments for pain. He is also the co-inventor of pain symptoms monitoring and management mobile phone app.

### **Education**

PhD Psychology, Duke University

MHS Epidemiology, Johns Hopkins University

### **Publications**

1. Jonassaint CR, Shah N, Jonassaint JC, De Castro L. Usability and Feasibility of an mHealth Intervention for Monitoring and Managing Pain Symptoms in Sickle Cell Disease: The Sickle Cell Disease Mobile Application to Record Symptoms via Technology (SMART). Hemoglobin. 2015;39(3):162-8. PMID: 25831427
2. Jonassaint CR, Jones VL, Leong S, Frierson GM. A systematic review of the association between depression and health care utilization in children and adults with sickle cell disease. BJH. In press.
3. Royal CD, Jonassaint CR, Jonassaint JC, De Castro LM. Living with sickle cell disease: traversing "race" and identity. Ethn Health. 2011 Aug-Oct;16(4-5):389-404. PMID: 21797725
4. Jonassaint CR, Jonassaint JC, Stanton MV, De Castro LM, Royal CD. The association of clinical and sociodemographic factors and coping styles among adults with sickle cell disease. J Natl Med Assoc. 2010 Nov;102(11):1045-9. PMID: 21141293

## *Nema Rao, MDes*

User Experience Designer, Microsoft Co., Remond, WA, recently graduated from the Communication and Interaction Design Program at Carnegie Mellon School of Design. Her thesis work is the basis for this project and she intends to continue development and evaluation efforts to make Expressive Painimations meet the needs of patients with cancer pain. She will consult on the project from a user experience design perspective; enhancing user satisfaction by improving the usability, accessibility, and pleasure provided in the interaction between the user and the product.

### **Education**

MDes, Communication and Interaction Design, Carnegie Mellon School of Design

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