PRAMOD KOTIPALLI

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SUMMARY

» Experienced engineer driven towards making novel contributions in research & formerly in entrepreneurship
» Research interests: human-computer interaction, human-centered product design, graphics, A.I., & robotics
» Award-winning filmmaker, photographer, & graphic artist · Advocate for diversity & inclusion in STEM

EDUCATION

Stanford University *September 2019 - June 2022*

Masters of Science · Computer Science · June 2022 (expected)

Research advisor: Sean Follmer

Concentrations : Human-Computer Interaction & Artificial Intelligence

Coursework: Image Synthesis Techniques (Matt Pharr & Pat Hanrahan) · Design of Smart Products (Sean Follmer) · Domain Specific Programming Models and Compilers (Fred Kjolstad) · Engineering Design Optimization (Mykel Kochenderfer) · Physically-Based Animation and Acoustics (Doug James)

Georgia Institute of Technology *August 2015 - August 2019*

Bachelors of Science · Computer Science · 2019

Primary research advisor: Thad Starner

GPA: 3.83/4.00 (Faculty Honors: 4.00 GPA in Spring 2016, Summer 2016, Spring 2017, & Spring 2018 terms)

Coursework: Machine Learning (Karl Gemayel) · Game A.I. (Stephen Lee-Urban) · Data Structures (Monica Sweat) · Design and Analysis of Algorithms & Automata and Complexity (H. Venkateswaran) · Assembly & C (Pat Leahy) · Object-Oriented Programming (Chris Simpkins) · Perception and Robotics (Sonia Chernova) · Number Theory and Cryptography (special topics w/ Matt Baker) · Behavioral Imaging (special topics w/ James Rehg) · History of Modern Industrial Design (Joyce Medina)

Interlake Senior High School *September 2011 - September 2015*

International Baccalaureate dipolma (conferred one year before international standard)

ACADEMIC EXPERIENCE

SHAPE Lab @ Dept. of Mechanical Engr. @ Stanford University *Stanford, CA (remote)*

Graduate Research Assistant w/ Prof. Daniel Drew & Prof. Sean Follmer *September 2019 - present*

» *Sound-source localization for multi-agent robotics systems (w/ Prof. Daniel Drew, University of Utah)*
  » Conducted literature review, experimented with Unity Game Engine's acoustics rendering
» *Model-predictive control for encounter-type haptics in virtual reality (w/ Eric J. Gonzalez. Ph.D. candidate)*
  » Understood relevant literature, implemented haptic redirection algorithms, currently contributing to Applications section of upcoming *CHI 2022* submission

Department of Genetics @ School of Medicine @ Stanford University *Stanford, CA (remote)*

Software Engineer · Part-time *March 2020 - July 2020*

» Developed software for early detection of COVID-19 from wearable fitness trackers with 1,200+ users
» Implemented dependency injection (Dagger) for Android to enable instrumented integration tests
» Led development of iOS & Android features to streamline onboarding & improve data collection process
» Paper: *"PHD: A Scalable, Secure, and Interoperable Platform for Big Data-Driven Health Management"* ·

School of Interactive Computing @ Georgia Institute of Technology *Atlanta, GA*

Project Lead + Undergraduate Research Asst. (w/ Prof. Thad Starner) *January 2018 - August 2019*

» *"RF-Pick: Comparing Order Picking Using a HUD with Wearable RFID Verification to Traditional Pick Methods"* published to ***ACM International Symposium on Wearable Computers***
  » Developed and analyzed Augmented Reality applications for intelligent warehouse mgmt. systems
  » Led efforts in software dev, study design, conducting user studies, statistics, and paper writing
  » Oral presentation given to ACM ISWC in Singapore resulting in ***Best Paper Award***
» *"Augmented Reality Head Worn Display Positioning for Sparse Order-Picking"* (pending publication)
  » Study sought to determine the most efficient virtual display position in an environment that requires walking and reading of information for tasks like warehouse order fulfilment.
  » Study determined that the center-right position provides the best-performing binocular display position for HWD manufacturers and warehouse order pickers while minimizing the risk of the cognitive capture observed in other studies using the center-center position.
  » Led development of sophisicated combinatorial graph search algorithms to find optimal "pick paths" to collect items in warehouse-like settings (e.g. libraries).
» *"Notification Perception with Visual Distraction on Google Glass and Smartwatches (Dual-Task)"*
  » We investigate how are notifications are perceived differently when presented on wrist-mounted displays (e.g. smartwatches) and head-worn displays (e.g. Google Glass). We formulate and execute a dual-task study paradigm pairing notification stimuli with a visual search distraction task developed by prior literature.

Undergraduate Research Assistant *January 2016 - December 2016*

» Developed predictive health analytics for heart disease patients with Professor James Rehg, Wall Lab
» Used MATLAB and Python to apply DSP + HMMs to on-body sensors to identify concerning behavior

ACADEMIC PUBLICATIONS

RF-Pick: order picking using a HUD with wearable RFID verification
Best Paper Award *@ ACM Intl. Symposium on Wearable Computers* *January 2018 - October 2018*
Authors: C. Thomas, T. Panagiotopoulos, ***P. Kotipalli****, M. Haynes, T. Starner*
Order picking accounts for 55% of the annual $60 billion spent on warehouse operations in the United States. Reducing human-induced errors in the order fulfillment process can save warehouses and distributors significant costs. We investigate a RFID-based verification method wherein wearable RFID scanners, worn on the wrists, scan passive RFID tags mounted on an item's bin as the item is picked; this method is used in conjunction with a head-up display (HUD) to guide the user to the correct item. We compare this RFID verification method to pick-to-light with button verification, pick-to-paper with barcode verification, and pick-to-paper with no verification. We find that pick-to-HUD with RFID verification enables significantly faster picking, provides the lowest error rate, and provides the lowest task workload.

PHD: A Scalable, Secure, and Interoperable Platform for Big Data-Driven Health Management
Under Review *in Nature Communications* *March 2020 - June 2020*
Authors: A. Bahmani, A. Alavi, T. Buergel, S. Upadhyayula, Q. Wang, S. Krishna Ananthakrishnan, D. Celis, D. Gillespie, G. Young, Z. Xing, M. Hoang Huynh Nguyen, A. Haque, A. Mathur, J. Payne, G. Mazaheri, J. Kenichi Li, ***P. Kotipalli****, L. Liao, B. Rolnik, A. Celli, O. Dagan-Rosenfeld, E. Higgs, W. Zhou, C. Lauren Berry, K. Grace Van Winkle, K. Contrepois, K. Bettinger, X. Li, M. Snyder*
The enormous amount of biomedical data derived from wearable sensors, electronic health records and molecular profilings (e.g., genomic profiling) is rapidly transforming our healthcare systems. These increasing amounts of data bring tremendous opportunities for improving health outcomes but also raise challenges ranging from data acquisition and storage to analysis and utilization. We developed a Personal Health Dashboard (PHD), which utilizes state-of-the-art security and scalability technologies to provide an end-to-end solution to these big data analytics challenges. The PHD platform is an open-source software framework that can easily be configured and deployed to any big data health project to support real-time data analysis at both the individual level and the cohort level. We illustrated the use of the PHD framework for large-scale applications in disease studies (e.g., COVID-19, insulin resistance).

Comparing Order Picking Guidance with Microsoft Hololens, Magic Leap, Google Glass XE and Paper
Published *to ACM HotMobile 2021* *October 2018 - February 2022*
Authors: G. Lin, T. Panigrahi, J. Womack, D. Jatin Ponda, ***P. Kotipalli****, T. Starner*
Head-worn displays (HWDs) are an efficient and cost-effective means to guide users in order picking, a task that requires users to alternate their attention between the physical en- vironment and the HWD's virtual image. After training 12 participants to expertise in picking, we compare three significantly different HWDs: Magic Leap One, Microsoft Hololens, and Google Glass Explorer Edition against paper pick lists (the industry standard). We find that previous find- ings on HWD benefits during such tasks are not reflected in all HWDs, suggesting that hardware design significantly influences efficacy. Based on experimental results and observations, we highlight challenges such as head weight, mounting, display clarity, field of view (FOV), and display position and discuss their possible effects on user comfort, user preference, task speed, and task accuracy.

Towards Finding the Optimum Position in the Visual Field for a Head Worn Display Used for Task Guidance with Non-registered Graphics
Published *to ACM IMWUT (March 2022 edition)* *October 2018 - March 2022*
Authors: G. Lin, G., M. Haynes, S. Srinivas, ***P. Kotipalli****, T. Starner*
Where should a HWD be placed in a user's visual field? We present two studies that compare comfort, preference, task efficiency and accuracy for various HWD positions. The first study offsets a 9.2° horizontal field-of-view (FOV) display temporally (toward the ear) from 0° to 30° in 10° steps. 30° proves too uncomfortable while 10° is the most preferred position for a simple button-pushing game, corroborating results from previous single-task reading experiments. The second experiment uses a Magic Leap One to compare 10° x 10° FOV interfaces centered at line-of-sight, temporally offset 15° (center-right), inferiorly offset 15° (bottom-center), and offset in both directions (bottom-right) for an order picking task. The bottom-right position proved worst in terms of accuracy and several subjective metrics when compared to the line-of-sight position.

ACADEMIC AWARDS

Best Paper Award *Singapore*
ACM International Symposium on Wearable Computers *Awarded: October 2018*
» Awarded for conducting a carefully-controlled study comparing new methods in wearables to current practices in the practical area of logistics. *RF-Pick: order picking using a HUD with wearable RFID verification*

Faculty Honors *Georgia Inst.of Tech, Atlanta, GA*
Office of the Registrar @ Georgia Institute of Technology *2016-2018*
» Awarded to students who earn a 4.0 GPA in a full-time academic semester
» Received in multiple semesters including Spring 2016, Summer 2016, Spring 2017, and Spring 2018

EXTRA-CURRICULAR ACTIVITES

<gt-webdev/> *January 2016 - December 2018*
President*, Officer, Technical Speaker* *College of Computing*
» Worked with several officers to routinely design (and re-design) web dev curriculum for beginner students
  » Lead weekly club meetings for 100+ students in attendance & hosted one-on-one "office hours" Led
» impactful initiatives as senior office and President including:
  » Stronger & inclusive recruiting efforts,
  » Consistent and engaging communication, and
  » Project-based collaborative learning projects for students.
» Closely interfaced with College of Computing leadership to develop an inclusive learning environment

INVITED TALKS

eWEAR Initiative (wearable computers) — *Stanford University*, *November 2020*

"Tangible teleportation kit: reducing the physical-emotional gap between 2D video calls and in-person interactions through friendly, immersive wearable haptics"

Presented by ***Pramod Kotipalli*** on behalf of Tangible Smart Clothing, Inc. Content contributors include Akshay Dinakar, Paul Lavengco, and Katie Fo.

Undergraduate Research Opportunities (UROP) — *Georgia Institute of Technology*

"RF-Pick: order picking using a HUD with wearable RFID verification" — *April 2019*

Presented by ***Pramod Kotipalli*** on behalf of the publication team under guidance from Professors Thad Starner and Gregory Abowd.

Cloud Rainstorm (weekend Splash program for high schoolers) — *Learning Unlimited (learningu.org)*

"The products we live with: a brief history of industrial design" — *May 2021*

Prepared and presented by ***Pramod Kotipalli***.

"Stories in 2D: Sketching & Design Thinking" — *May 2021*

Prepared and presented by (alphabetically) Elyse Chase, Brian Do, ***Pramod Kotipalli***, and Ahad Rhaf.

GRANTS

CHI 2021: Gary Marsden (Virtual) Travel Award — *Remote*

ACM SIGCHI — *March 2021*

» Grants cost-free sign up for the CHI 2021 conference as well as registration for up to three courses and up to three workshops at the conference.

Richard Tapia Diversity Conference attendance grant — *Remote*

Sponsor: Stanford Computer Science Department — *October 2020*

» Developed situational awareness around race-based discrimination and inclusion efforts in STEM

Grace Hopper Conference travel grant — *Houston, TX*

Sponsor: Google — *October 2016*

» 1 / 100 students awarded full scholarship to attend Grace Hopper Celebration of Women in Computing

» Developed skills based on demonstrated interest/experience in promoting the role of women in computing

ACADEMIC SERVICE

Conference Reviewer

ACM ISWC 2021

Course Assistant — *Stanford Mgmt. Sci. & Engr.*

ENGR 145S: Technology Entrepreneurship — *Summer 2021*

INDUSTRY EXPERIENCE

Space Exploration Technologies Corp. (SpaceX) — *Hawethorne, CA*

Software Engineering Intern — *September 2017 - December 2017*

» Designed, implemented, tested software solutions · Worked closely with PMs and UX designers

» Automated supply chain processes in ERP: mitigated legal risk, increased business efficiency

» Engineered SQL Server + .NET/C# backend that exposed RESTful APIs to AngularJS front-end

Cisco Systems — *San Jose, CA*

Software Engineering Intern — *May 2017 - August 2017*

» Architected, researched, implemented test automation framework for Cisco's Cloud DVR services

» Developed load testing and analysis framework to generate HTTP traffic and collect relevant statistics

» Designed AngularJS front-end with Python RESTful API and ELK · Orchestrates Docker containers

» Saved 10+ hr/wk of manual and error-prone OS/network configuration · Increases engineer efficiency

ATSDR @ U.S. Centers for Disease Control and Prevention (CDC) — *Atlanta, GA*

Technical Consultant — *August 2018 - May 2019*

» Researched user requirements, architected, and delivered automated air quality analysis pipeline

» Drastically reduced time for publishing reports on air quality, assisting CDC in its public health missions

» Architected and developed desktop application to automate processing data from air quality sensors

School of Mechanical Engineering @ Georgia Institute of Technology — *Atlanta, GA*

Lead Software Developer (w/ Dr. Amit Jariwala, Director of Innovation) — *January 2016 - May 2018*

» Built service used by 2,500 students and judges in Georgia Tech's Capstone Design Expo.

» Integrated user feedback for highly-intuitive UX significantly reducing user onboarding.

» Collaborated through Git-centered workflows with a tight feedback loop from advisers.

Anomo Inc. — *Seattle, WA*

Product Management Intern — *September 2014 - June 2015*

» Collected user experience feedback, drafted product requirements for anonymous social networking app

INDUSTRY PATENTS

Wearable Haptic System for Immersive Social Telepresence (Co-Inventor)

USPTO Provisional Patent No. 63086349 (Assigned to Tangible) — *Filed: May 2020*

*Authors: A. Dinakar, **P. Kotipalli**. P. Lavengco, K. Fo*

(More information may be made available upon request.)

INDUSTRY AWARDS & HONORS

Winner (Active Tooling Category) & Best Use of Google Cloud — *Univ. of Washington, Seattle, WA*
Dubhacks for Social Good & Hack'20 (respectively) — *September 2020*
- » Developed app to documents and analyze police encounters to help mitigate negative interactions
- » Displays Constitutional and Miranda rights while inconspicuously analyzing voice sentiment and context

Microsoft Prize — *Emory University, Atlanta, GA*
HackATL — *November 2016*
- » Won 2nd place in Microsoft Prize category at HackATL, a tech startup hackathon at Emory University.
- » Created hardware prototype for smart watches wearers to shake hands and connect online.

VENTURE-FORMATION EXPERIENCE

Tangible Smart Clothing Inc. (d.b.a. Tangible Teleportation Co.) — *Stanford, CA & Remote*
Advisor — *April 2021 - present*
- » Actively supporting team with transition to new software engineering leads
- » Routine conversations with founding team as to user-centered development & product design

Co-Founder, Founding Engineer, *Head of Software* — *April 2020 - April 2021*
- » Leading software initiatives to build the "world's first teleportation kit" through the use of immersive haptics
- » Our hardware lets you to feel the presence of your loved ones at a distance · https://tangible.team/

Copilot AI — *Atlanta, GA & Stanford, CA*
Founder — *April 2018 - December 2019*
- » Conducted need-finding, competitive analysis, investor interfacing, customer pilots, & business analysis
- » Product: augmented reality wearable computers for front-line warehousing & factory workers
- » Unique value proposition: comfortable on-body user experience, proprietary A.I. & computer vision analysis of worker gestures/movements for in-situ optimization of manual processes
- » Conclusion: Abandoned plan due to poor unit economics & unreasonably-long (in time & capital) distribution strategy due to need for large traveling salesforce & geographically sparse · Authored comprehensive 30-page business plan (available upon request)

Safely — *Atlanta, GA*
Co-Founder, Founding Engineer (Software) — *October 2016 - February 2017*
- » Product: Campus-safety wearable computers to replace ineffective Blue Light systems
- » Conclusion: Abandoned due to failed team dynamics · Raised >$20k in angel & award funding

OneBand LLC — *Seattle, WA*
Founder — *September 2014 - June 2016*
- » Product: Predictive health-analysis subscription service for in-house wearable smart watch fitness band

VENTURE-FORMATION AWARDS & HONORS

Accel Fellow @ Accel Leadership Program — *Singapore*
Stanford Technology Ventures Program, Dept. of Mang. Sci. & Engr. — *Accepted: November 2020*
- » One of 24 entrepreneurial Stanford graduate students selected for immersive training in leading startups
- » Will be working with high-growth venture CEOs & other fellows to develop business case studies

Grand Prize winner — *Emory University, Atlanta, GA*
HackATL — *November 2016*
- » Awarded for developing and presenting comprehensive business plan to Atlanta-area venture capitalists
- » Developed wearable tech for on-demand community help in emergency situations on college campuses

CREATIVE EXPERIENCE & AWARDS

Freelance Filmmaker, Composer, Photographer, & Graphic Designer — *Anywhere on Earth*
Personal explorations — *December 2018 - present*
- » Designed, animated, edited, and published over 40 short videos and 30+ high-quality static renders
- » Demonstrates improving skills in animation, modeling, video production, sound mixing, and vector art
- » Continuing to gain mastery of MAXON's Cinema 4D and Adobe's Creative Cloud products
- » Portfolio continues to grow with new original work uploaded every week: https://instagram.com/p13i.io/

Best in City, Best Film, Best Music — *Seattle*
Seattle 48 Hour Film Festival — *October 2018*
- » Served as Composer, Script Supervisor, and Production Assistant for 48-hour film festival production
- » Team also won *Best Actor, Best Actress, Best Editing, Best Direction,* and *Co-Best Writing* amongst 25 teams and 100 talented regional filmmakers

SELECTED ENGINEERING PROJECTS

Remembrance Agent
Library to display contextually-relevant notes based on keyboard input *July 2019 - December 2019*
- » Based on concept of a Remembrance Agent (RA) was first outlined by Rhodes and Starner in 1997
- » Designed as system that automatically presents contextually-relevant notes, documents, and contacts
- » Integrates with Google's Gmail, Drive, and Cloud Speech APIs through a Java Swing desktop GUI

Glass Notes for Google Glass
Android, web, and terminal applications to augment memory in class *January 2019 - December 2019*
- » Based on system designed by Thad Starner at MIT Media Lab in the late 1990s · redesigned for today
- » Allows for offline note taking using Bluetooth keyboard · periodically syncs to GitHub Gists

dARts
play darts in augmented reality *May 2018*
- » Designed interactive experience for collaborative darts game in augmented reality
- » Used iOS frameworks like SceneKit to draw planes/objects into real-world with ARKit

MetroSync
a web app to help musicians rehearse together *May 2018*
- » Designed/implemented web app featuring metronome synced across devices aiding in musical practice
- » Developed real-time Web Socket-based app · Shared information between AngularJS front-end, REST API

RichCaptions
symbolic math captions for educational videos *September 2016*
- » Designed/implemented UX for captioning and viewing videos with LaTeX-rendered math captions
- » Developed AngularJS front-end leveraging YouTube API · Exposed Django REST API + PostgreSQL

SKILLS

HUMAN-COMPUTER INTERACTION & RESEARCH METHODS	UX Research · UI Design · Study Design (counter-balancing, dual-task, learning effects, etc.) · Interview Design · Data Visualization · HCI Statistics
PROGRAMMING LANGUAGES	Python · C++ · JavaScript/TypeScript · C# · Swift · Java · HTML5 / CSS3 · Shell · C
DEVELOPMENT FRAMEWORKS	Django REST Framework · iOS · Android · React Native · .NET · Angular · Ionic · NodeJS · Android · Retrofit · Google Glass Development Kit (GDK) · Dagger (Android dependency injection) · LLVM C++ API
PACKAGING & DEPLOYMENT	Vagrant · Docker · Heroku · Microsoft Azure · Digital Ocean · Gradle · NuGet · Google Play deployment · Apple App Store Connect Deployment
VERSION CONTROL & CONTINUOUS INTEGRATION	Git · Self-hosted Jenkins pipelines · Travis CI · CircleCI, Wercker · GitHub Actions · Automated Testing Strategies (end-to-end, integration, unit, etc.)
DATABASES	Microsoft SQL Server (T-SQL) · PostgreSQL · Redis · MySQL · Firebase Realtime Database · MongoDB
A.I. & MACHINE LEARNING	Digital Signal Processing · MATLAB · scikit-learn · TensorFlow
GRAPHIC DESIGN, ANIMATION, &	Sketch (macOS) · Adobe (Illustrator, After Effects, Premiere Pro, Photoshop, Audition, InDesign, Lightroom, Bridge, XD) · MAXON Cinema 4D · Octane Render · World Creator 2 (procedural landscape generation), PBRT Renderer (https://pbrt.org/) · Portraiture
SOFTWARE ENGINEERING CONCEPTS	RESTful API Design · Containerization · Virtualization · Distributed System Design · Message Queues / Task Queues · Micro-Service Design · Dependency Injection / Inversion of Control · Programmatic Reflection

PORTFOLIOS

Online portfolio: http://portfolio.p13i.io/

PDF portfolio: http://pdf.portfolio.p13i.io/

Technical writing: http://writing.p13i.io/