# Julian RAMOS

▪ (+1) 412-7088874  |  ✉ ing.julianr@gmail.com  |  🏠 www.julian-ramos.com  |  🎓 Julian Ramos

## Summary

My research develops **mobile health (mHealth) technologies for sensing and improvement of health and wellness**. My main interest is in personalized mHealth: re-imagining health interventions as a process that adapts automatically to a patient's health and preferences. I develop methods that use artificial intelligence (AI) to optimize mHealth interventions for each patient, selecting what, when, and how to intervene informed by sensors and human-feedback, in an interactive process. I have over 12 years of research experience applying machine learning on multidisciplinary projects that have ranged from detecting Nuclear threats to estimating psychological stress levels while exercising. I have also worked on interaction techniques like pioneering work on gesture recognition from a smartwatch (Serendipity) and a technique that transforms the surface of the keyboard into a touchpad (Keyboard Surface Interaction).

## Education

**Carnegie Mellon University**                                                      *Pittsburgh, PA, USA*
Ph.D. in Computer Science
Dissertation title: The personalization of mobile health interventions using wearables, human-feedback and      *Aug. 2015 - May. 2021 (expected)*
Artificial Intelligence

**Carnegie Mellon University**                                                      *Pittsburgh, PA, USA*
M.Sc. in Human-computer Interaction                                                 *Aug. 2015 - Aug. 2019*

**Universidad Militar Nueva Granada**                                               *Bogota, Colombia*
B.Eng. in Mechatronics Engineering                                                  *Aug. 2000 - Aug. 2006*

## Honors & Awards

| | | |
|---|---|---|
| **Smart and connected health student travel award**, National Science Foundation | *Alexandria, VA* | 2020 |
| **Future Faculty Career Exploration Program**, Rochester Institute of Technology | *Rochester, NY* | 2019 |
| **Microsoft Dissertation Grant**, Microsoft Research | *Redmond, WA* | 2019 |
| **Interdisciplinary summit on the foundations of data science**, ACM-IMS | *San Francisco, CA* | 2019 |
| **Center for Machine Learning and Health Fellowship**, Pittsburgh Health Data Alliance | *Pittsburgh, PA* | 2017 |
| **Best paper award**, ACM Ubicomp | *Heidelberg, Germany* | 2016 |
| **Facebook fellowship finalist**, Facebook | *Menlo Park,CA* | 2016 |
| **Honorable Mention (Best paper nominee)**, IEEE Percom | *St. Louis, MI* | 2015 |
| **2nd Place**, EVAAL 2nd Competition - Activity recognition track | *Madrid, Spain* | 2012 |
| **Summer Scholar**, Robotics Institute Summer Scholar Program, Carnegie Mellon University | *Pittsburgh, PA* | 2008 |
| **Young Researcher Fellowship**, Universidad Militar Nueva Granada | *Bogota, Colombia* | 2007 |
| **2nd Place**, Programming Marathon, Universidad Militar Nueva Granada | *Bogota, Colombia* | 2006 |
| **1st Place**, Robotics Challenge, School of Engineering, Universidad Militar Nueva Granada | *Bogota, Colombia* | 2005 |

## Publications (Peer reviewed Conferences and Journal Articles)

[20]  Julian **Ramos**, Steven Dang, Rushil Khurana, Mayank Goel, and Anind K Dey. Sleepu: Exploring the personalization of content and timing of treatment using wearables, human-feedback and artificial intelligence. In ***Submission Ubicomp 2021***, *Chapter 2 and 3 of my thesis proposal **(link)***, 2021

[19]  Julian **Ramos**, Johana Rosas, Shen Yilin, Jin Hongxia, and Anind Dey. Activity recommendation: Optimizing life in the long term. In *2020 IEEE International Conference on Pervasive Computing and Communications (PerCom)*, pages 1–10, 2020

[18]  Sha Zhao, Shijian Li, Julian **Ramos**, Zhiling Luo, Ziwen Jiang, Anind K Dey, and Gang Pan. User profiling from their use of smartphone applications: A survey. *Pervasive and Mobile Computing*, 59:101052, 2019

[17]  Sha Zhao, Julian **Ramos**, Jianrong Tao, Ziwen Jiang, Shijian Li, Zhaohui Wu, Gang Pan, and Anind K Dey. Who are the smartphone users? identifying user groups with apps usage behaviors. *GetMobile: Mobile Computing and Communications*, 21(2):31–34, 2017

[16]  Julian **Ramos**, Mary Beth Kery, Stephanie Rosenthal, and Anind Dey. Sampling techniques to improve big data exploration. In *2017 IEEE 7th symposium on large data analysis and visualization (LDAV)*, pages 26–35. IEEE, 2017

[15]  Nikola Banovic, Anqi Wang, Yanfeng Jin, Christie Chang, Julian **Ramos**, Anind Dey, and Jennifer Mankoff. Leveraging human routine models to detect and generate human behaviors. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, pages 6683–6694, 2017

[14]  Julian **Ramos**, Zhen Li, Johana Rosas, Nikola Banovic, Jennifer Mankoff, and Anind Dey. Keyboard surface interaction: making the keyboard into a pointing device. *arXiv preprint arXiv:1601.04029*, 2016

[13] Hongyi Wen, Julian **Ramos**, and Anind K Dey. Serendipity: Finger gesture recognition using an off-the-shelf smartwatch. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, pages 3847–3851, 2016

[12] 🏆 Sha Zhao, Julian **Ramos**, Jianrong Tao, Ziwen Jiang, Shijian Li, Zhaohui Wu, Gang Pan, and Anind K Dey. Discovering different kinds of smartphone users through their application usage behaviors. In *Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, pages 498–509, 2016

[11] Tadashi Okoshi, Hiroki Nozaki, Jin Nakazawa, Hideyuki Tokuda, Julian **Ramos**, and Anind K Dey. Towards attention-aware adaptive notification on smart phones. *Pervasive and Mobile Computing*, 26:17–34, 2016

[10] Tadashi Okoshi, Julian **Ramos**, Hiroki Nozaki, Jin Nakazawa, Anind K Dey, and Hideyuki Tokuda. Reducing users' perceived mental effort due to interruptive notifications in multi-device mobile environments. In *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, pages 475–486, 2015

[9] ⏳ Tadashi Okoshi, Julian **Ramos**, Hiroki Nozaki, Jin Nakazawa, Anind K Dey, and Hideyuki Tokuda. Attelia: Reducing user's cognitive load due to interruptive notifications on smart phones. In *2015 IEEE International Conference on Pervasive Computing and Communications (PerCom)*, pages 96–104. IEEE, 2015

[8] Jin-Hyuk Hong, Julian **Ramos**, and Anind K Dey. Toward personalized activity recognition systems with a semipopulation approach. *IEEE Transactions on Human-Machine Systems*, 46(1):101–112, 2015

[7] Hristijan Gjoreski, Simon Kozina, Matjaz Gams, Mitja Lustrek, Juan Antonio Álvarez-García, Jin-Hyuk Hong, Julian **Ramos**, Anind K Dey, Maurizio Bocca, and Neal Patwari. Competitive live evaluations of activity-recognition systems. *IEEE Pervasive Computing*, 14(1):70–77, 2015

[6] Julian **Ramos**, Jin-Hyuk Hong, and Anind K Dey. Stress recognition-a step outside the lab. In *International Conference on Physiological Computing Systems*, volume 2, pages 107–118. SCITEPRESS, 2014

[5] ⏳ Jin-Hyuk Hong, Julian **Ramos**, Choonsung Shin, and Anind K Dey. An activity recognition system for ambient assisted living environments. In *International Competition on Evaluating AAL Systems Through Competitive Benchmarking*, pages 148–158. Springer, 2012

[4] Jin-Hyuk Hong, Julian **Ramos**, and Anind K Dey. Understanding physiological responses to stressors during physical activity. In *Proceedings of the 2012 ACM conference on ubiquitous computing*, pages 270–279, 2012

[3] Anind K Dey, Katarzyna Wac, Denzil Ferreira, Kevin Tassini, Jin-Hyuk Hong, and Julian **Ramos**. Getting closer: an empirical investigation of the proximity of user to their smart phones. In *Proceedings of the 13th international conference on Ubiquitous computing*, pages 163–172, 2011

[2] Julian **Ramos**, Sajid Siddiqi, Artur Dubrawski, Geoffrey Gordon, and Abhishek Sharma. Automatic state discovery for unstructured audio scene classification. In *2010 IEEE International Conference on Acoustics, Speech and Signal Processing*, pages 2154–2157. IEEE, 2010

[1] Julian **Ramos**, Mauricio Sarmiento, and Watson Escobar. Reconocimiento de patrones en un arreglo sensórico usando redes neuronales. *Ciencia e Ingeniería Neogranadina*, 17(1):95–111, 2007

## Experience

### Samsung Research America - Artificial Intelligence Center
*Mountain View,CA*

Supervisor - Ph.D. Yilin Shen

*May. 2016 - Aug. 2016*

Research Intern
- Developed a reinforcement learning method to estimate long term rewards of activities of daily living from behavioral logs (e.g., sleep, steps, positive affect).

### Carnegie Mellon University - Human-computer Interaction Institute
*Pittsburgh,PA*

Ubicomp Lab, Supervisor - Ph.D. Anind Dey

*Jul. 2010 - Jul. 2015*

Research Programmer
- Stress recognition from physiological signals
- Activity recognition from accelerometer data.
- Built a prototype that transforms the keyboard's surface into a touchpad.
- Using phone sensor data, built a classifier that detects if the user is likely to click or not a on notification.

### Carnegie Mellon University - Robotics Institute
*Pittsburgh,PA*

AutonLab, Supervisor - Ph.D. Arthur Dubrawski

*Jul. 2009 - Jul. 2010*

Research Programmer
- Nuclear threats detection using random forests (Collaboration with the Lawrence Livermore National Lab).
- Loggerhead turtle's nest localization from ground penetrating radar(GDPR) data (Sponsored by Disney resorts Florida).

### Carnegie Mellon University - Machine Learning Department
*Pittsburgh,PA*

AutonLab, Supervisors - Ph.D Geoff Gordon, Ph.D. Arthur Dubrawski

*Feb. 2009 - May. 2009*

Research Visitor
- Implementation and testing of a C++ API for audio recognition using HMMs.
- Nuclear threats detection using random forests (Collaboration with the Lawrence Livermore National Lab).

**Carnegie Mellon University - Robotics Institute**                                      *Pittsburgh,PA*

SELECT Lab, Supervisor - Ph.D. Geoff Gordon

Summer Scholar                                                                          *Jun. 2008 - Sep. 2008*

- Developed a driver for a stereo camera in the Carnegie Mellon Robotics Navigation Toolkit (CARMEN).

**Universidad Militar Nueva Granada - School of Engineering**                           *Bogota, Colombia*

Complex Particulate Systems Lab, Supervisor - Ph.D. Watson L. Vargas

Young Researcher Fellowship                                                             *Jan. 2007 - Dec. 2008*

- Implementation (hardware and software) of a robot for odor source localization.

**Universidad Militar Nueva Granada - School of Engineering**                           *Bogota, Colombia*

Complex Particulate Systems Lab, Supervisor - Ph.D. Watson L. Vargas

Research Assistant                                                                      *Aug. 2006 - Dec. 2006*

- Design and implementation (hardware and software) of a system for odor recognition using Neural Networks.
- Design (hardware and software) of a robot for odor source localization.

## Teaching Experience

**Carnegie Mellon University - Human-computer Interaction Institute**                   *Pittsburgh, PA*

Programming Usable Interfaces                                                           *Spring 2020*

**Carnegie Mellon University - Human-computer Interaction Institute**                   *Pittsburgh, PA*

User Centered Research and Evaluation                                                   *Spring 2019*

## Invited Talks

**University of Michigan -Computer Science and Engineering Seminar**                    *Ann Arbor,MI*

Mobile Health approaches to Precision Medicine                                          *Nov. 2020*

**Dartmouth Geisel School of Medicine - Center for Technology and Behavioral Health Seminar**    *Lebanon,NH*

Personalizing time of treatment and content in a sleep intervention using sensors, human-feedback and AI    *Nov. 2020*

**Carnegie Mellon University - Programmable User Interfaces, Guest Lecture**            *Pittsburgh,PA*

Personalizing health interventions using AI and human feedback                         *Apr. 2020*

**Carnegie Mellon University - Human-AI interaction, Guest Lecture**                    *Pittsburgh,PA*

AI for mobile health interventions                                                      *Oct. 2019*

**Carnegie Mellon University - Mobile Sensing + Health Institute Seminar**              *Pittsburgh,PA*

SleepU: Effects of a Context-Based Personalized Sleep Health Intervention for College Students    *Oct. 2019*

**Rochester Institute of Technology - Golisano College of Computing Colloquium**       *Rochester,NY*

SleepU: Effects of a Context-Based Personalized Sleep Health Intervention for College Students    *Sep. 2019*

## Media Coverage

**Microsoft Dissertation Grant** , Microsoft Research Blog                              2019

**Meet the CMLH Fellows** , CMU SCS News                                                2017

**How to Operate Your Smart Watch with the Same Hand That Wears It** , MIT Technology review    2016

## Students Mentored

**Uma Pradeepan**, Undergraduate Student, Carnegie Mellon University                    2019

**Varshini Selvadurai**, Undergraduate Student, Carnegie Mellon University              2019

**Carolyn Zhong** , Undergraduate Student, Carnegie Mellon University                   2019

**Elizabeth La**, Undergraduate Student, Carnegie Mellon University                     2019

**Yun-Chun Liu**, Masters Student - Human-computer interaction, Carnegie Mellon University    2019

**Qian Wang**, Undergraduate Student - visitor, Tsinghua University                     2017

**Hongyi Wen**, Undergraduate Student - visitor, Tsinghua University, China             2015

**Ben Solecki**, Masters Student - Information Technology, Carnegie Mellon University    2014

**Zhen Li**, Undergraduate Student - visitor, Tsinghua University                       2014

# Service

**Representative in the School of Computer Science Diversity, Equity and Inclusion committee**, Representative of the Ph.D. students at the SCS-DEI meetings — 2020

**Mentor in the CMU-AI Mentoring program**, Meet monthly with undergraduate students from underepresent groups in computer science with the goal of involving them in research in AI within CMU — 2020

**Ph.D. advisory committee School of Computer Science** , Lead a team investigating ways to improve and adapt the Ph.D. students evaluation to the 2020 pandemic — 2019-2020

**Reviewer**, Ubicomp, CHI, UIST, and IEEE Transactions on Systems, Machine and Cybernetics — 2015-2020

**Sports organizer** , Organized sport and recreational activities (e.g., soccer, basketball, voleyball — 2015-2016

# Skills

| | |
|---|---|
| **Reinforcement Learning** | Q-Learning, Double Q-Learning,Contextual Bandits |
| **Supervised learning** | HMMs, Probabilistic Graphical Models, Deep Learning (ConvNets, LSTM) |
| **Unsupervised learning** | HMMs, Spectral clustering, Autoencoders |
| **Natural language processing** | Latent Dirichlet Allocation, Latent Semantic Analysis, word2vec, BERT |
| **Python - Data analysis** | Tensorflow, keras, scikit-learn, pandas, seaborn |
| **R - Data analysis** | ggeffects,lme4 (Mixed-Models), ARTool |
| **Programming** | Python, Java (Android), latex, Weka, MySQL, SQLite |
| **Languages** | Spanish(fluent), English(fluent) |

# Coursework

## Ph.D.

Deep Reinforcement Learning (10703)
Statistical Techniques in Robotics (16831)
Graduate Artificial Intelligence (15780)
User centered research
HCI. Process and Theory
Applied Research Methods

Design Perspectives in HCI
Cognitive Perspectives in HCI
Computer Science Perspectives in HCI
Applied Fabrication Techniques
Game Design

## Non-Degree Student

Machine Learning (10701)
Intermediate Statistics (10705)
Robot Motion Planning (16735)
Regression Analysis (70208)

Concepts of Mathematics (21-127)
Introduction to Statistical Inference (36226)
Introduction to Probability Theory (36225)

# References

Mentors and collaborators who have written references for me:

**Anind K. Dey**
*Professor and Dean*
Information School
University of Washington
anind@uw.edu

**Mayank Goel**
*Assistant Professor*
Human-computer Interaction Institute
Carnegie Mellon University
mayankgoel@cmu.edu

**Carissa Low**
*Assistant Professor*
Department of Medicine
Division of Hematology/Oncology
University of Pittsburgh
lowca@upmc.edu

**Robert Kraut**
*Herbert A. Simon Professor Emeritus of
Human-Computer Interaction*
Human-computer Interaction Institute
Carnegie Mellon University
robert.kraut@cmu.edu

**Stephanie Rosenthal**
*Assistant Teaching Professor*
Computer Science Department
Carnegie Mellon University
srosenth@andrew.cmu.edu

**Jennifer Mankoff**
*Richard E. Ladner Professor*
School of Computer Science
University of Washington
jmankoff@uw.edu

**SeungJun Kim**
*Professor*
School of Integrated Technology
Gwangju Institute of Science Technology
seungjun@gist.ac.kr

**Geoff Gordon**
*Professor*
Machine Learning Department
Carnegie Mellon University
ggordon@cs.cmu.edu
*Director*
Microsoft Research Montreal Lab