

# Gina L. Sprint

Assistant Professor  
Gonzaga University

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## Education

### Computer Science, PhD

Aug 2012 - May 2016

Integrative Training in Health-Assistive Smart Environments Certificate

School of Electrical Engineering and Computer Science

Washington State University (WSU), Pullman, WA

Dissertation: *Analysis of Changes in Sensor Data for Mobility Assessment*

Advisor: Dr. Diane J. Cook

GPA: 4.0

### Computer Science, BS

Sept 2009 - March 2012

Mathematics Minor

College of Science, Technology, Engineering, and Mathematics

Eastern Washington University (EWU), Cheney, WA

Advisor: Dr. Stuart G. Steiner

GPA: 3.99 GPA, Summa Cum Laude, Honors Ad Majorem

### High School Diploma

Sept 2005 - June 2009

Lakeside High School, Nine Mile Falls, WA

GPA: 4.0, Valedictorian

## Research Interests

Wearable Computing, Sensor Data Mining, Machine Learning, Technology Applications for Health Care, and Computer Science Education

## Publications

### Journal Articles

- Gina Sprint, Diane Cook, and Shelly Fritz. *Behavioral Differences Between Subject Groups Identified Using Smart Homes and Change Point Detection*. IEEE JBHI, 2020 (to appear). (journal impact factor: 4.217)
- Allison Fellger, Gina Sprint, Douglas Weeks, Elena Crooks, and Diane Cook. *Wearable Device-Independent Next Day Activity and Next Night Sleep Prediction for Rehabilitation Populations*. IEEE Journal of Translational Engineering in Health and Medicine, vol. 8, pp. 1-9, 2020. (journal impact factor: 2.075)
- Douglas Weeks, Gina Sprint, Diane Cook, Virgeen Stilwill, and Amy Lou Meisen-Vehrs. *Implementing Wearable Sensors for Continuous Assessment of Daytime Heart Rate Response in Inpatient Rehabilitation*. Telemedicine and E-Health, vol. 24, no. 12, p. 1014-1020, 2018. (journal impact factor: 1.931)

- Diane Cook, Glen Duncan, Gina Sprint, and Shelly Fritz, *Using Smart City Technology to Make Healthcare Smarter*. Proceedings of the IEEE, vol. 106, no. 4, p. 708-722, 2018. (journal impact factor: 10.694)
- Gina Sprint, Diane Cook, Douglas Weeks, Jordana Dahmen, and Alyssa La Fleur, *Analyzing Sensor-based Time Series Data to Track Changes in Physical Activity During Inpatient Rehabilitation*. Sensors, vol. 17, no. 10, p. 2219, 2017. (journal impact factor: 3.275)
- Gina Sprint, Diane Cook, Shelly Fritz, and Maureen Schmitter-Edgecombe. *Using Smart Homes to Detect and Analyze Health Events*. IEEE Computer, vol. 49, no. 11, p. 29-37, 2016. (journal impact factor: 3.564)
- Gina Sprint and Diane Cook. *Unsupervised Detection and Analysis of Changes in Everyday Physical Activity Data*. Journal of Biomedical Informatics, vol. 63, p. 54-65, 2016. (journal impact factor: 3.526)
- Gina Sprint, Diane Cook, Douglas Weeks, and Vladimir Borisov. *Predicting Functional Independence Measures Scores During Rehabilitation with Wearable Inertial Sensors*. IEEE Access, vol. 3, p. 1350-1366, 2015 (video). (journal impact factor: 3.745)
- Gina Sprint, Diane Cook, and Douglas Weeks. *Towards Automating Clinical Assessments: A Survey of the Timed Up and Go*. IEEE Reviews in Biomedical Engineering, vol. 8, p. 64-77, 2015. (journal impact factor: 6.180)

#### Conference Proceedings

- Gina Sprint and Erik Fox. *Improving Student Study Choices in CS1 with Gamification and Flipped Classrooms*. In 2020 Proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE), p. 773-779, 2020.
- Allison Fellger, Gina Sprint, Alexa Andrews, Douglas Weeks, and Elena Crooks. *Night-time Sleep Duration Prediction for Inpatient Rehabilitation Using Similar Actigraphy Sequences*. In 2019 IEEE Healthcare Innovations and Point-of-Care Technologies (HI-POCT), p. 41-44, 2019.
- Gina Sprint and Jason Conci. *Mining GitHub Classroom Commit Behavior in Elective and Introductory Computer Science Courses*. In Journal of Computing Sciences in Colleges (CCSC NW Conference Proceedings), p. 76-84, 2019.
- Jason Conci, Gina Sprint, Diane Cook, and Douglas Weeks. *Utilizing Consumer-grade Wearable Sensors for Unobtrusive Rehabilitation Outcome Prediction*. In 2019 IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), p. 1-4, 2019.
- Jordana Dahmen, Alyssa La Fleur, Gina Sprint, Diane Cook, and Douglas Weeks. *Using Wrist-worn Sensors to Measure and Compare Physical Activity Changes for Patients Undergoing Rehabilitation*. In 2017 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops), p. 667-672, 2017. Honorable mention for best paper award.
- Vladimir Borisov, Gina Sprint, Diane Cook, and Douglas Weeks. *Measuring Changes in Gait and Vehicle Transfer Ability During Inpatient Rehabilitation with Wearable Inertial Sensors*. In 2017 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops), p. 425-430, 2017.

- Gina Sprint, Diane Cook, and Douglas Weeks. *Patient Similarity and Joint Features for Rehabilitation Outcome Prediction*. In IJCAI Knowledge Discovery in Healthcare Data Workshop, p. 1-6, 2016.
- Gina Sprint, Diane Cook, Roschelle Fritz, and Maureen Schmitter-Edgecombe. *Detecting Health and Behavior Changes by Analyzing Smart Home Sensor Data*. In 2016 IEEE International Conference on Smart Computing (SMARTCOMP), p. 1-3, 2016.
- Gina Sprint, Diane Cook, and Douglas Weeks. *Designing Wearable Sensor-based Analytics for Quantitative Mobility Assessment*. In 2016 IEEE International Conference on Smart Computing (SMARTCOMP), p. 1-8, 2016.
- Gina Sprint, Diane Cook, and Douglas Weeks. *Quantitative Assessment of Lower Limb and Cane Movement with Wearable Inertial Sensors*. In 2016 IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), p. 418-421, 2016.
- Gina Sprint and Diane Cook. *Enhancing the CS1 Student Experience with Gamification*. In 2015 IEEE Integrated STEM Education Conference, p. 94-99, 2015. H. Robert Schroeder Best Paper Award (4.65% of accepted papers).
- Gina Sprint, Vladimir Borisov, Diane Cook, and Douglas Weeks. 2014. *Wearable Sensors in Ecological Rehabilitation Environments*. In Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication, p. 163-166, 2014.

### Book Chapters

- Gina Sprint, Diane Cook, and Maureen Schmitter-Edgecombe, *Unsupervised Detection and Analysis of Changes in Everyday Physical Activity Data*. In: D. Holmes, L. Jain. (eds) Advances in Biomedical Informatics. Intelligent Systems Reference Library, vol. 137, 2018. Springer, Cham.

### Peer Reviewed Abstracts

- Ellie Ottman, Kendell Erickson, Gina Sprint, Kimberly Honn, Douglas Weeks, and Elena Crooks. *Sleep Characteristics after Acute Stroke Vs. Traumatic Brain Injury*. American Physical Therapy Association CSM, 2020.
- Abbie Aamot, Elena Crooks, Gina Sprint, Kimberly Honn, and Douglas Weeks. *Use of Subjective Fatigue to Predict Cognition in Patients with Acute Stroke or Brain Injury*. American Physical Therapy Association CSM, 2020.
- Kristen Lane, Elena Crooks, Gina Sprint, and Douglas Weeks. *Daytime Sleepiness and Functional Outcomes after Neurological Insult*. American Physical Therapy Association CSM, 2020.
- Kendall Erickson, Ellie Ottman, Gina Sprint, Douglas Weeks, and Elena Crooks. *Actigraphy-Assessed Daytime Sleep, Nighttime Sleep and Functional Outcomes in Patients with Neurological Insult*. American Physical Therapy Association CSM, 2020.
- Gina Sprint. *Mobile App Development: Android or iOS? An Experience Report from Teaching Both Platforms*. ACM Special Interest Group on Computer Science Education (SIGCSE), 2019.
- Gina Sprint and Andy O'Fallon. *Engaging Programming Assignments to Recruit and Retain CS0 Students*. ACM Special Interest Group on Computer Science Education (SIGCSE), 2018.

- Douglas Weeks, Gina Sprint, Diane Cook, Alyssa La Fleur, and Jordana Dahmen. *Continuous Assessment of Daytime Heart Rate Response During Inpatient Rehabilitation*. ACRM Annual Conference on Progress in Rehabilitation Research (PIRR), 2017.
- Gina Sprint. *Using Smart Homes to Detect and Analyze Health Events*. Grace Hopper Celebration of Women in Computing, 2017.
- Gina Sprint and Shira Broschat. *CS0: Who is Enrolling?* International Computing Education Research (ICER) Conference, 2017.
- Gina Sprint. *Detecting and Analyzing Changes in Everyday Physical Activity Data*. WSU GPSA Research Exposition, 2016.
- Jordana Dahmen, Gina Sprint, Diane Cook, and Douglas Weeks. *Physical Therapist Feedback Regarding Wearable Technology*. Annual Biomedical Research Conference for Minority Students, 2016.
- Gina Sprint and Diane Cook. *Wearable Sensor Data and Medical Records for Clinical Outcome Prediction*. Grace Hopper Celebration of Women in Computing, 2015.
- Vladimir Borisov, Gina Sprint, Diane Cook, and Douglas Weeks. *Employing Wearable Sensors To Assess Ambulation in Rehabilitation Patients*. Inland Northwest Research Symposium: Research and Innovations in Health Sciences from Bench-top to Bedside, 2015.
- Gina Sprint, Vladimir Borisov, Diane Cook, and Douglas Weeks. *Wearable Sensors in Ecological Rehabilitation Environments*.
  - WSU Academic Showcase, 2015.
  - Dr. William R. Wiley Research Symposium, 2015.
  - Amazon Graduate Research Symposium, 2014.

### Courses Taught

- Computer Science II w/C++ (GU CPSC 122), Spring 2020.
- Mobile Application Development w/Android and Java (GU CPSC 312), Fall 2017, Fall 2019.
- Software Development w/Java (GU CPSC 224), Fall 2019.
- Data Mining w/Python (GU CPSC 310), Spring 2019.
- Mobile Application Development w/iOS and Swift (GU CPSC 315), Fall 2018.
- Computer Science I w/C++ (GU CPSC 121), Spring 2019, Fall 2018, Spring 2018.
- Data Analytics Systems and Algorithms w/Python (designed WSU CptS 215), Spring 2018.
- Introduction to Algorithmic Problem Solving w/Python (WSU CptS 111), Spring 2017, Fall 2016.
- Program Design and Development w/C (WSU CptS 121), Summer 2015, Summer 2014.
- Learn to Code! Programming for Girls (WSU CougarQuest workshop for middle school students), Summer 2015.

**Academic Experience**

**Assistant Professor** Gonzaga University, Spokane, WA August 2017 - Present

- Designing and teaching undergraduate programming courses.
- Implementing new curriculum and pedagogies adapted from professional development workshops and CS education research literature.
- Mentoring senior design teams, CS majors, and undergraduate researchers.

**Clinical Assistant Professor** WSU, Pullman, WA May 2016 - May 2017

- Designed and taught undergraduate programming courses, both face to face and online.
- Mentored senior design teams, CS majors, and undergraduate researchers.

**Research Intern** St. Luke's Rehabilitation Institute, Spokane, WA Oct 2013 - Present

- Collaboratively designing studies to track changes in physical movement using wearable sensors.
- Currently assisting in recruiting, consenting, and testing study participants.
- Programming wearable sensors and processing collected data.

**Research Assistant** WSU, Pullman, WA Aug 2012 - May 2016

- Performed interdisciplinary research in the Center for Advanced Studies in Adaptive Systems (CASAS) lab.
- Investigated wearable sensor data mining and machine learning for healthcare applications.
- Performed research in system verification and validation for Intel In Target Probe software and debug boards.

**Graduate Instructor** WSU, Pullman, WA Summer 2014, Summer 2015

- Taught an introductory undergraduate programming course, Program Design and Development in C.
- Designed lectures, labs, programming assignments, exams, and interactive programming practice sessions for the students.
- Performed CS education research in gamification, resulting in an IEEE ISEC best paper award.

**Professional Experience**

**Software Engineer Intern** Intel Corp., DuPont, WA May 2013 - Aug 2013

- Researched and designed an extensible architecture to collect and visualize processor validation data in real-time.
- Authored an architecture specification document, product specification document, user guide, and tutorial for the project.
- Presented results at the Intel Design and Test Technology Conference, 2013. (poster)

**Software Engineer** Infinetix Corp., Spokane Valley, WA March 2012 - Aug 2012

- Designed and implemented new features for utility radio boards that extended functionality and diagnostic support.
- Verified and validated new features and corresponding code implementations.

**Software Engineer Intern** Infnetix Corp., Spokane Valley, WA June 2011 - Sept 2011

- Validated software for a clinical chemistry analyzer machine for FDA approval.
- Identified and fixed bugs in the embedded system.
- Updated associated software requirements specifications documents.

**Computer Tech Specialist** EWU, Cheney, WA Sept 2010 - March 2012.

- Installed, updated, and troubleshooted computer hardware and software for a multi-use computer lab.

### Awarded Grants

- Gonzaga Career and Professional Development (CPD) office faculty grant (\$500), 2019. Launching a Book Club for Junior and Senior Computer Science Students.
- Computing Research Association Women (CRA-W) Collaborative Research Experience for Undergraduates (CREU) grant (\$11,500), 2018 - 2019. Using Machine Learning to Investigate the Relationship Between Physical Activity and Sleep Data for Healthcare Applications. Co-investigator: Dr. Doug Weeks.
- National Institute of Health R25 grant (\$911,651), 2017 - 2020. Development of an Online Course Suite in Tools for Analysis of Sensor-Based Behavioral Health Data (AHA!). Principal investigator: Dr. Diane J. Cook. Co-investigators: Dr. Maureen Schmitter-Edgecombe, Dr. Anantharaman Kalyanaraman, Dr. Shelly Fritz.
- Travel grants (SWE ALWE 2017; ACM SIGCSE 2017; IEEE Rising Stars 2017; NSF/IEEE SmartComp, 2016; WSU EECS, 2016; WSU GPSA, 2016; IEEE ISEC, 2015; CRA-W, 2015; ACM UbiComp, 2014).
- National Center for Women and IT (NCWIT) Student Seed Fund, 2015. Funds for our Broadening Participation in Computing (BPC) club to run a summer coding camp for middle school girls. Co-investigators: Jessamyn Dahmen and Dr. Shira Broschat.
- WSU Graduate and Professional Student Association student club award, 2014. Funds for our BPC club. Co-investigator: Jessamyn Dahmen.

### Honors and Awards

- National Center for Women in Information Technology (NCWIT) EngageCSEdu Engagement Excellence award winner for two of my CS1 assignment (“Are you a Fan?” Quiz and Lightboard Lab).
- IEEE PerCom WristSense workshop honorable mention for best paper award, 2017.
- WSU Best Computer Science Graduate Student, 2016.
- WSU GPSA Research Exposition 1<sup>st</sup> place poster presentation winner, 2016. (poster)
- IEEE Integrated STEM Education Conference H. Robert Schroeder best paper award, 2015. (slides)
- WSU Dr. William R. Wiley Research Exposition 2<sup>nd</sup> place poster presentation winner, 2015. (poster)
- WSU National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT) Fellow, 2012 - 2015.
- EWU Outstanding Computer Science Graduate, 2012.

- EWU Ad Majorem Honors College Graduate, 2012.

### Scholarships

- Grace Hopper Celebration of Women in Computing Scholarship, 2015.
- EWU Academic Honors, President's, and Trustee's Scholarship, 2009 - 2011.
- Washington Water Power Legacy Scholarship Foundation 4<sup>th</sup> Place Winner, 2010.
- Washington Water Power Legacy Scholarship Foundation 1<sup>st</sup> Place Winner, 2009.

### Conference and Symposium Presentations

#### Oral

- CCSC NW Conference, 2019, Forest Grove, OR.
- Grace Hopper Celebration of Women in Computing IoT/Emerging Tech Session, 2017, Orlando, FL. (slides)
- International Joint Conference on Artificial Intelligence (IJCAI) Knowledge Discovery in Healthcare Data Workshop, 2016, New York City, NY. (slides)
- IEEE SmartComp, 2016, St. Louis, MO. (slides)
- IEEE Biomedical and Health Informatics (BHI), 2016, Las Vegas, NV. (slides)
- Grace Hopper Celebration of Women in Computing IoT/Emerging Tech Session, 2015, Houston, TX. (slides)
- IEEE Integrated Stem Education Conference (ISEC), 2015, Princeton, NJ. (slides)

#### Poster

- ACM SIGCSE, 2019, Minneapolis, MN. (poster)
- ACM SIGCSE, 2018, Baltimore, MD. (poster)
- IEEE SmartComp, 2016, St. Louis, MO. (poster)
- WSU GPSA Research Exposition, 2016, Pullman, WA. (poster)
- Computing Research Association - Women (CRA-W) Grad Cohort Workshop, 2015, San Francisco, CA.
- WSU Academic Showcase, 2015, Pullman, WA.
- Technology Alliance Insight to Impact: Transforming Washington's Industries through Big Data, 2015, Seattle, WA.
- WSU Dr. William R. Wiley Research Exposition, 2015, Pullman, WA.
- Amazon Graduate Research Symposium, 2014, Seattle, WA. (poster)
- ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), 2014, Seattle, WA. (poster)
- UbiComp BPC Workshop, 2014, Seattle, WA.
- EWU Creative Works Symposium, 2011, Cheney, WA.

#### Demo

- Intel Design and Test Technology Conference, 2013, Portland, OR. (poster)

**Workshops and Seminars**

- Consortium for Computing Sciences in Colleges (CCSC) Northwestern Regional Conference, 2018, Bothell, WA.
- Society of Women Engineers (SWE) Academic Leadership workshop (ALWE) and WE, 2017, Austin, TX.
- University of Washington LATTICE symposium, 2017, Seattle, WA.
- NCWIT Summit, 2016, Red Rock Canyon, NV.
- Process Oriented Guided Inquiry-based Learning (POGIL) workshop, 2016, Pullman, WA.
- Grace Hopper Celebration of Women in Computing, 2017, Orlando, FL; 2015, Houston, TX; 2014, Phoenix, AZ.
- UbiComp SmartHealthSys and BPC Workshop, 2014, Seattle, WA.
- Edward Tufte on Presenting Data and Information Seminar, 2013, Seattle, WA.
- WSU Graduate Teaching Workshop, 2013, 2015, Pullman, WA.
- WSU Grant Writing Workshop, 2012, Pullman, WA.

**Professional Memberships**

- Institute of Electrical and Electronics Engineers (IEEE), IEEE Engineering in Medicine and Biology Society (EMBS), and IEEE Education Society, 2014 - Present.
- Association for Computing Machinery (ACM), ACM-Women (ACM-W), and ACM Special Interest Group for Computer Science Education (SIGCSE), 2011 - Present.
- Society of Women Engineers (SWE), 2017 - Present.
- Society for Industrial and Applied Mathematics (SIAM), 2015 - Present.

**Activities and Organizations**

- Computer science outreach
  - Spokane DjangoGirls coach, 2018.
  - WSU CptS 111 (Introduction to Programming with Python) recruiting website content manager, 2016 - 2017.
  - WSU EECS High School Partnership Program (HSPP) girls' host and mentor, 2016 - 2017.
  - WSU NCWIT Academic Alliance member representative, 2016.
  - NCWIT Aspirations in Computing Eastern Washington committee member, 2015 - 2017.
  - WSU Dr. Universe programming question answerer, 2017.
  - WSU Broadening Participation in Computing (BPC) club co-founder, 2014.
- IEEE PerCom PerHealth Workshop technical program committee member, 2018, 2019.
- EAI BodyNets Conference technical program committee member, 2016.

- Peer Reviewer (IEEE PerHealth, 2018, 2019; Pervasive and Mobile Computing (PMC), 2018; IEEE TBME, 2017; GHC, 2017; ACM ITiCSE, 2017; ACM SIGCSE, 2017; EAI BodyNets, 2016; MDPI Sensors, 2016; IEEE Computer, 2016; ACM CHI, 2016; PMC, 2015; ACM Ubicomp, 2014).
- WSU Graduate and Professional Student Association (GPSA) senator, 2013 - 2014.
- WSU Tabletop Gaming Association Student (TTGA) club advisor, 2013 - 2017.

**Mentoring**

- Faculty founder and leader of GU CS Book Club, 2019 - Present.
- Faculty mentor for senior design teams, 2016 - Present.
- Faculty advisor for undergraduate CS majors, 2016 - Present.
- WSU faculty sponsor for the ACM International Collegiate Programming Competition (ICPC), 2016.
- Mentor for undergraduate research students (REU, CREU, GSUR), 2015 - Present.
  - Tristan Call, CS Major, Gonzaga University, 2019 - Present.
  - Kelsey Lally, CS/Communication Studies Major, Gonzaga University, 2019 - Present.
  - Alli Fellger, CS Major, Gonzaga University, 2018 - Present.
  - Alexa Andrews, CS Major, Gonzaga University, 2018 - 2019.
  - Erik Fox, CS Major, Gonzaga University, 2018 - 2019.
  - Jason Conci, CS Major, Gonzaga University, 2017 - 2019.
  - Alyssa La Fleur, Math/CS Major, Whitworth University, 2016 - 2017.
  - Jordana Dahmen, Biology/Kinesiology Major, WSU, 2015 - 2017.
- Mentor for undergraduate women in ACM-W, 2015 - Present.