

Heba Aly

CONTACT INFORMATION	Address: 425 106th Ave NE, Bellevue, WA 98004, USA. WWW: https://hebaaly.github.io/	Mobile: +1 (310) 273-4029 Email: heba@cs.umd.edu hebaaly@amazon.com
RESEARCH INTERESTS	Spatial Systems, Intelligent Systems, Mobile/Pervasive Computing.	
EDUCATION	University of Maryland, College Park, MD, USA PhD in Computer Science	2015—2019
	Alexandria University, Faculty of Engineering, Alexandria, EG Masters Degree in Computer and Systems Engineering, Bachelors Degree in Computer and Systems Engineering, <ul style="list-style-type: none">• Grade: <i>Distinction with Degree of Honor</i>• Cumulative Score: 90.33% (Rank: 4th)	Aug. 2015 Jul. 2011
RESEARCH EXPERIENCE	Research Scientist at Amazon Research Assistant at MIND Lab@UMD <i>Supervisor:</i> Prof. Ashok Agrawala, Ph.D Research Assistant at WRC@EJUST <i>Supervisor:</i> Prof. Moustafa Youssef, Ph.D	2019—Present 2016—2019 2012—2015
TEACHING EXPERIENCE	Teaching Assistant Computer Science Department, UMD: <ul style="list-style-type: none">• CMSC 420: Data Structures• CMSC 436: Programming Handheld Systems• CMSC 131: Object-Oriented Programming I Computer and Systems Engineering Dept., Alexandria Univ.: <ul style="list-style-type: none">• Numerical analysis, SW Engineering, Object Oriented Programming (OOP), Distributed systems, and Digital design.	2011—2019 Fall'18, Spring'19 Fall'15, Spring'16, Spring'17, Fall'17 Fall'16 Fall 2011—Spring 2015
CONFERENCE PUBLICATIONS	<ul style="list-style-type: none">• Better off This Way!: Ubiquitous Accessibility Digital Maps via Smartphone-based Crowdsourcing Heba Aly, Moustafa Youssef and Ashok Agrawala IEEE SECON 2021 (26% Acceptance Rate)• On the Value of Spatiotemporal Information: Principles and Scenarios Heba Aly, John Krumm, Gireeja Ranade and Eric Horvitz ACM SIGSPATIAL 2018 (20% Acceptance Rate) [Best Paper Runner Up]• Hapi: A Robust Pseudo-3D Calibration-Free WiFi-based Indoor Localization System Heba Aly and Ashok Agrawala Mobiquitous, 2018• Towards Ubiquitous Accessibility Digital Maps for Smart Cities (Vision Paper) Heba Aly, Moustafa Youssef and Ashok Agrawala ACM SIGSPATIAL 2017	

- Zephyr: Ubiquitous Accurate multi-Sensor Fusion-based Respiratory Rate Estimation Using Smartphones
Heba Aly and Moustafa Youssef.
IEEE INFOCOM 2016 (18.25% Acceptance Rate)
- semMatch: Road Semantics-based Accurate Map Matching for Challenging Positioning Data
Heba Aly and Moustafa Youssef
ACM SIGSPATIAL 2015 (18% Acceptance Rate)
- LaneQuest: An Accurate and Energy-Efficient Lane Detection System
Heba Aly, Anas Basalamah and Moustafa Youssef
IEEE Percom 2015 (7.7% Full Paper Acceptance Rate)
- ubiMonitor: Intelligent Fusion of Body-worn Sensors for Real-time Human Activity Recognition
Heba Aly and Mohamed A. Ismail; ACM SAC 2015
- It's the Human that Matters: Accurate User Orientation Estimation for Mobile Computing Applications
Nesma Mohssen, Rana Momtaz, **Heba Aly** and Moustafa Youssef
Mobiquitous 2014 (19.3% Acceptance Rate)
- Accurate and Efficient Map Matching for Challenging Environments
Reham Mohamed, **Heba Aly**, and Moustafa Youssef
ACM SIGSPATIAL 2014 (Short Paper)
- Map++: A Crowd-sensing System for Automatic Map Semantic Identification
Heba Aly, Anas Basalamah, and Moustafa Youssef
IEEE SECON 2014 (19.8% Acceptance Rate)
- Dejavu: An Accurate Energy-Efficient Outdoor Localization System
Heba Aly and Moustafa Youssef
ACM SIGSPATIAL 2013 (17% Acceptance Rate). [Best Paper]
- New Insights Into Wifi-based Device-Free Localization
Heba Aly and Moustafa Youssef
ACM UbiComp Adjunct 2013.

JOURNAL
PUBLICATIONS

- Computing Value of Spatiotemporal Information
Heba Aly, John Krumm, Gireeja Ranade and Eric Horvitz
CACM Research Highlights, 2020 [Nominated by ACM SIGSPATIAL]
- To Buy or Not to Buy: Computing Value of Spatiotemporal Information
Heba Aly, John Krumm, Gireeja Ranade and Eric Horvitz
ACM Transactions on Spatial Algorithms and Systems (ACM TSAS), 2019 [Invited]
- TrueStory: Accurate and Robust RF-based Floor Estimation for Challenging Indoor Environments
Rizanne Elbakly, **Heba Aly** and Moustafa Youssef
IEEE Sensors Journal, 2018
- Accurate and Energy-Efficient GPS-Less Outdoor Localization
Heba Aly, Anas Basalamah and Moustafa Youssef
ACM Transactions on Spatial Algorithms and Systems (ACM TSAS), 2017 [Invited]
- Accurate Real-time Map Matching for Challenging Environments
Reham Mohamed, **Heba Aly**, and Moustafa Youssef
IEEE Transactions on Intelligent Transportation Systems (IEEE T-ITS), 2017
- Humaine: A Ubiquitous Smartphone-based User Heading Estimation for Mobile Computing Systems
Nesma Mohssen, Rana Momtaz, **Heba Aly** and Moustafa Youssef
GeoInformatica, 2017
- Automatic Rich Map Semantics Identification through Smartphone-based Crowd-sensing
Heba Aly, Anas Basalamah and Moustafa Youssef
IEEE Transactions on Mobile Computing (IEEE TMC), 2016

	<ul style="list-style-type: none"> • Robust and Ubiquitous Smartphone-based Lane Detection Heba Aly, Anas Basalamah and Moustafa Youssef Pervasive and Mobile Computing, 2016. [Invited] • An Analysis of Device-Free and Device-Based WiFi-Localization Systems Heba Aly and Moustafa Youssef International Journal on Ambient Intelligence and Computing (IGI), 2014. [Invited]
RESEARCH DEMOS & POSTERS	<ul style="list-style-type: none"> • Zephyr Demo: Ubiquitous Accurate multi-Sensor Fusion-based Respiratory Rate Estimation Using Smartphones. Heba Aly and Moustafa Youssef <i>IEEE INFOCOM 2016</i>. • Smartphone-based Crowd-sensing for Digital Maps Semantics Enrichment. Heba Aly <i>N2Women Workshop at ACM MobiCom 2016</i>. [Best Poster] • Demonstrating Map++: A Crowd-sensing System for Automatic Map Semantics Identification. Shuja Jamil Sheikh, Anas Basalamah, Heba Aly and Moustafa Youssef IEEE, SECON 2014. • Demo: New DfP localization insights Heba Aly and Moustafa Youssef CoSDEO workshop. In ACM, UbiComp Adjunct, 2013.
PATENTS	<ul style="list-style-type: none"> • Method and System for an Accurate Energy-Efficient Outdoor Localization on a Mobile Device; Heba Aly and Moustafa Youssef. U.S. Patent No: 9,967,818. May, 2018 • Method and System for an Accurate and Energy-Efficient Vehicle Lane Detection Heba Aly, Anas M. Basalamah and Moustafa Youssef. Patent Application No: 14/661272, USA. • Method and System for Crowd Sensing to be used for Automatic Semantic Identification. Anas M. Basalamah, Heba Aly and Moustafa Youssef. Patent Application No: 14/636153, USA.
AWARDS AND HONORS	<ul style="list-style-type: none"> • Selected as one of the 2019 Innovators Under 35 by MIT Technology Review Arabia. • Selected to participate in Rising Stars in EECS 2019. • Best paper runner up award in ACM SIGSPATIAL 2018. • Selected as one of ten Rising Stars in Networking and Communications by N2Women for 2017. • Best poster award in N2Women workshop at ACM MobiCom 2016. • First Prize Group Category in the COMESA Innovation Awards 2014/15, 2015. • Certificate of Appreciation and a Prize from Umm Al-Qura University, 2014. • Best paper award in ACM SIGSPATIAL 2013. • Paper Selected as one of top papers in IEEE PerCom 2015 for Pervasive and Mobile Computing journal special issue. • Paper Selected for International Journal on Ambient Intelligence and Computing journal special issue 2014. • Degree of Honor from Faculty of Engineering, Alexandria Univ., 2011.
SCHOLARSHIPS AND GRANTS	<ul style="list-style-type: none"> • Women Techmakers scholarship from Google, 2017. • Google Grace Hopper Travel Grant, 2017. • University of Maryland Graduate School Dean's Fellowship, 2015 and 2016. • NSF Travel Grant Award 2015 (ACM SIGSPATIAL), 2016 (IEEE INFOCOM), 2017 (ACM SIGSPATIAL) and 2018 (ACM SIGSPATIAL).

- **N2Women Young Researcher Fellowship** 2014 and 2016.
- **N2Women Travel Grant** 2016.
- **IEEE Student Travel Grant** to attend IEEE PerCom 2015.
- **Google Student Travel Grant Award** to attend ACM SIGSPATIAL 2014.
- **IEEE Communications Society Student Travel Grant** to attend IEEE SECON 2014.

PROFESSIONAL SERVICE

- Serving in the N2Women 2020 and 2021 board as a social media co-chair.
- **Program Committee member:**
 - ACM SIGSPATIAL 2019, Grace Hopper 2020, GEOProcessing 2020, IEEE MDM 2020, ACM SIGSPATIAL 2020, Grace Hopper 2021, IEEE MDM 2021, ACM SIGSPATIAL 2021
- **Reviewer:**
 - **2021:** IEEE TMC, IEEE TKDE, PMC, IEEE IoT
 - **2020:** IEEE TMC, PMC, IEEE Internet of Things Journal, IEEE T-ITS, ACM TSAS, IEEE TVT, ACM IMWUT (UbiComp).
 - **2019:** IEEE TKDE, IEEE TMC, IEEE Sensors Journal, IEEE the Computer Journal, IEEE Internet of Things Journal, IEEE T-ITS, ACM TSAS, IEEE TVT, ACM IMWUT (UbiComp).
 - **2018:** IEEE TMC, IEEE TVT, IEEE T-ITS, Journal of Field Robotics, PMC, Journal of Ambient Intelligence and Humanized Computing, ACM TSAS, IEEE TKDE, IEEE Sensors Journal.
 - **2017:** IEEE SECON, ACM CHI, IEEE TMC, IEEE ICDCS, ACM TSAS, ACM IMWUT (UbiComp), IEEE T-ITS.
 - **2016:** IEEE INFOCOM'17, IEEE TMC, ACM TOSN, IEEE VTC-Fall'16, IET Intelligent Transport Sys., KSII Trans. on Internet and Information Sys., IEEE Sensors Journal.
 - **2015:** IEEE TVT, Expert Systems with Applications (ESWA)—Elsevier Journal.
 - **2014:** IEEE MDM 2014.
- Organizer for the N2Women event at IEEE INFOCOM 2016.
- Student volunteer: ACM SIGSPATIAL 2018, 2017, 2015, 2014.

INVITED TALKS

- **Penn State**, “Intelligent Mobile Systems for Social Good”. (2019)
- **UC Irvine**, “Intelligent Mobile Systems for Social Good”. (2019)
- **UC Merced**, “Intelligent Mobile Systems for Social Good”. (2019)
- **Amazon**, “Ubiquitous Localization in Challenging Environments”. (2019)
- **Lehigh University**, “Ubiquitous Localization in Challenging Environments”. (2019)
- **Brandeis University**, “Intelligent Mobile Systems for Social Good”. (2020)
- **IEEE MDM 2020 - Ph.D. forum**, Career paths after Ph.D. panel. (2020)

INTERNSHIPS

- Microsoft Research Lab - Redmond May'17 — Aug.'17
 - Mentor: Dr. John Krumm, PhD.
- Microsoft Research Advanced Technology Labs Cairo July 2010 — September 2010
 - Task: Porting MS Maren (A tool for Arabic transliteration) to windows Mobile, with memory and performance enhancements.

TRAININGS

- Cloud Infrastructure and Services (CIS) Workshop at EMC² Feb. 2013
- The Alexandria ACM Chapter Algorithms Training Summer 2008

TECHNICAL SKILLS

- Programming languages: *Java (J2SE)*, *MATLAB*, and *Python*.
- Mobile Development: *Android*.
- Web development: *HTML*, *XML*, *CSS3*, *Java Script*, *J2EE*, *Python*, and *PHP*.