Artem Dementyev

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EDUCATION

Massachusetts Institute of Technology, Cambridge, Massachusetts, USA
Doctor of Philosophy (Ph.D.) in Media Arts and Sciences — Sep 2013 – May 2019
- Adviser: Professor Joseph Paradiso
- Thesis: Dynamic Wearable Technology
- Cumulative GPA: 4.9 / 5.0

University of Washington, Seattle, Washington, USA
Master of Science (M.S.) in Electrical Engineering — Sep 2011 – Aug 2013
- Adviser: Professor Joshua R. Smith
- Thesis: Applications of RF-powered computing systems: wearable EEG monitor and bistable display tag

University of Maryland, College Park, Maryland, USA
Bachelor of Science (B.S.) in Bioengineering — Sep 2006 – Jul 2009

RESEARCH INTERESTS

- Novel sensors design
- Ubiquitous computing
- Human-computer interactions. New hardware and sensors for wearable devices
- Robotics; electromechanical systems
- Novel mass manufacturing and research scaling

AWARDS

- YouFab Finalist, Chainform — 2017
- UIST Best Paper Award (top 1%) — 2016
- CHI Honorable Mention Award (top 5%) — 2015
- UbiComp Honorable Mention Award (top 5%) — 2013
- NSF Graduate Research Fellowship — 2012
- NIH Outstanding Post-Baccalaureate IRTA Award — 2011

RESEARCH EXPERIENCE

Media Lab, Massachusetts Institute of Technology
Graduate Research Assistant, Responsive Environments Group — Sep 2013 – Present
- Advisor: Professor Joseph A. Paradiso
- Implemented hardware-based research projects in various areas: sensor networks, human-computer interactions, robotics, and health
- Presented research via demos and talks to sponsor companies and served as teaching assistant in several courses
- Led or collaborated on around 11 projects, that led to publications in leading conferences and journals

Google X, Mountain View, CA
Intern — Sep 2018 – Dec 2018
- Supervisor: Alex Olwal
- Hardware prototyping

Microsoft Research, Redmond, WA
Research Intern, Natural Interactions Group — Jun 2016 – Sep 2016
- Supervisor: Christian Holz
- Researched wearable devices for health. Designed and built hardware and performed user studies
- Applied for a patent and published journal paper: DualBlink: A Wearable Device to Continuously Detect, Track and Actuate Blinking for Alleviating Dry Eyes and Computer Vision Syndrome

Electrical Engineering Department, University of Washington
Graduate Research Assistant, Sensor Systems Lab — Sep 2012 – Sep 2013
- Advisor: Professor Joshua R. Smith
- Developed a battery-free EEG recording system, powered by UHF RFID
- Researched wireless powered bistable displays; perpetual displays that are powered by smartphone's NFC
- Published two research papers

Microsoft Research, Cambridge, UK
Research Intern, Sensors and Devices Group — Jun 2012 – Aug 2012
- Supervisors: Dr. Steve Hodges, Stuart Taylor
- Prototyped input devices for mobile phones and researched the efficiency of wireless protocols.
- Published conference paper: "Power consumption Analysis of Bluetooth Low Energy, ZigBee and ANT Sensor Nodes in Cyclic sleep scenario

National Institute of Biomedical Imaging and Bioengineering (NIBIB), NIH
Postbaccalaureate Research Fellow — Sep 2009 – Sep 2011
- Supervisors: Dr. Alexander Gorbach
- Designed miniature wireless sensors for real-time data display, storage, transmission for long-term skin and ambient temperature
- Conducted clinical research in non-invasive imaging, and did data analysis by applying digital signal processing, and medical statistics

OTHER WORK EXPERIENCE

MIT Manufacturing Summer Course, Shenzhen, China
Student — Jun 2015 – Jul 2015
- Learned about mass manufacturing of hardware under supervision of bunnie (Andrew) Huang
- Visited various factories in China

Mentor — Jun 2016 – Jul 2015
- Designed electronics for a watch, that was used to teach mass manufacturing.

Mentor/Co-organizer/Researcher — Jun 2017 – Jul 2015
- Mentored students with manufacturing various electronics projects
- Helped with organization and structure of the course
- Factory stay lead to a published paper in IROS titled ”Mass Manufacturing of Self-Actuating Robots: Integrating Sensors and Actuators using Flexible Electronics”

Mentor/Co-organizer — Jun 2018 – Jul 2015
- Helped with organization and structure of the course
- Mentored students on manufacturing

Human Biosciences Inc, Gaithersburg, MD
Intern — Jun 2009 – Sep 2009
- Programmed and repaired electrical systems of production equipment, for manufacture of collagen based medical wound dressings

Food and Drug Administration (FDA), College Park, MD
Intern — Jan 2007 – Jan 2008
- Determined whether products such as canned soup and sauces were free of harmful microorganisms

TEACHING

Mentor/co-organizer, MIT
- MIT Research at Scale Course — 2016,2017,2018

Teaching Assistant , MIT
- MAS.500: Intro to Applied Machine Learning Module — 2014
- MAS.S63: Silicon Menagerie: From Bioinspiration to Biomimetics — 2014
- MAS.836: Sensor Systems for Interactive Environments — 2015, 2016, 2017

Teaching Assistant , University of Washington
- EE399: Design of Digital Circuits and Systems — 2012
- EE542: Advanced Embedded Systems Design — 2013
- EE447: Control Systems Analysis — 2011

ADVISING

MIT UNDERGRADUATE RESEARCHERS.
- **Viktor Urvantsev**, SkinBot localization — 2018
- **Rianna Jitosho**, Soft Robotics — 2018
- **Mairead Solvang**, SkinBot localization — 2018
- **Justina R Yang**, Rovables mechanics — 2017
- **Diana Lamaute**, Rovables electronics — 2016
- **Lucas Santana**, Rovables localization — 2016
- **Kyle Joba-Woodruff**, ChainForm electronics — 2016

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Reviewer
- CHI — 2015, 2016, 2017, 2018
- UIST — 2016, 2017, 2018
- Augmented Human — 2015, 2016
- DIS — 2016

EXHIBITIONS

Machine Experience II, ”Bluetooth Morph”, Rainbow Unicorn, Berlin, Germany — 2018
Radical Atoms Exhibition, ”Rovables”, Ars Electronica Museum, Linz, Austria — 2016

JOURNAL PUBLICATIONS

All are peer reviewed

[1] **A. Dementyev**, J. Hernandez, I. Choi, S. Follmer, J. Paradiso, "Epidermal Robots: Wearable Sensors That Climb On The Skin" in *Proc. of (Ubicomp) IMWUT'18* (To appear)

[2] **A. Dementyev**, C. Holz, "DualBlink: A Wearable Device to Continuously Detect, Track, and Actuate Blinking For Alleviating Dry Eyes and Computer Vision Syndrome" in *Proc. of (Ubicomp) IMWUT'17*

[3] K. Nakagaki, S. Follmer, **A. Dementyev**, J. Paradiso, H. Ishii, "Designing Line-Based Shape-Changing Interfaces" in *Proc. of Pervasive Computing'17*

CONFERENCE PUBLICATIONS

All are peer reviewed

[1] **A. Dementyev**, J. Qi, J. Ou, J. Paradiso, "Mass Manufacturing of Self-Actuating Robots: Integrating Sensors and Actuators using Flexible Electronics" in *Proc. of IROS'18* (To appear)

[2] J. Amores, J. Hernandez, **A. Dementyev**, X. Wang, P Maes, "BioEssence: A Wearable Olfactory Display That Monitors Cardio-Respiratory Information to Support Mental Wellbeing" in *Proc. of EMBC'18*

[3] C. Kao, D. Ajilo, O. Anilionyte, **A. Dementyev**, I. Choi, S. Follmer, C. Schmandt, "Exploring Interactions and Perceptions of Kinetic Wearables" in *Proc. of DIS'17*

[4] **A. Dementyev**, C. Kao, I. Choi, D. Ajilo, M. Xu, J. Paradiso, C. Schmandt, S. Follmer, "Rovables: Miniature on-body robots as mobile wearables" in *Proc. of UIST'16* **Best Paper Award**

[5] K. Nakagaki, **A. Dementyev**, S. Follmer, J. Paradiso, H. Ishii, "Chainform: A linear integrated modular hardware system for shape changing interfaces" in *Proc. of UIST'16*

[6] **A. Dementyev**, C. Kao, and J. Paradiso, "SensorTape: Modular and Programmable 3D-Aware Dense Sensor Network on a Tape," in *Proc. of UIST'15*

[7] N. Zhao, G. Dublon, N. Gillian, **A. Dementyev**, J. Paradiso, "EMI Spy: Harnessing electromagnetic interference for low-cost, rapid prototyping of proxemic interaction," in *Proc. of BSN'15*

[8] C. Kao, **A. Dementyev**, J. Paradiso, and C. Schmandt "NailO: Fingernails as an Input Surface," in *Proc. of CHI'15* **Honorable Mention Award**

[9] **A. Dementyev**,and J. Paradiso, "WristFlex: Low-power gesture input with wrist-worn pressure sensors," in *Proc. of UIST'14*

[10] **A. Dementyev**, J. Gummeson, D. Thrasher, A. Parks, D. Ganesan, J. R Smith, A. P Sample "Wirelessly powered bistable display tags" in *Proc. of Ubicomp'13* **Honorable Mention Award**

[11] **A. Dementyev**, and J. R Smith, "A Wearable UHF RFID-Based EEG System" in *Proc. of RFID'13*

[12] **A. Dementyev**, S Hodges, S Taylor, and J. R Smith, "Power Consumption Analysis of Bluetooth Low Energy, ZigBee and ANT Sensor Nodes in a Cyclic Sleep Scenario" in *Proc. of IEEE IWS'13*

[13] **A. Dementyev**, A. Behnaz, and A.M. Gorbach, "135-Hour-Battery-Life Skin Temperature Monitoring System Using a Bluetooth Cellular Phone" in *Proc. of IEEE BioWireless'13*

[14] Scully, C. G., W. Liu, J. Meyer **A. Dementyev**, K. H. Chon, P. Innominato, F. Lévi, and A. M. Gorbach, "Time-frequency analysis of skin temperature in a patient with a surface tumor monitored with infrared imaging" in *Proc. Quantitative Infrared Thermography'10*

PATENTS

[1] M. Aziz, L. Considine, A. Dementyev, N. Olivares, A. Adekoya, J. Rustag, "Quick-release self-contained medical electrode", *U.S. patent. US20130172724, 2013.*

SELECTED PRESS COVERAGE

Design News, 'Hacking Manufacturing' MIT Course Opens Manufacturing Techniques 2018
MIT News, Hacking in a Factory 2018
Creative Applications, Media Lab Hacking Manufacturing 2018
Hardware News, Life hack for manufacturing: MIT studies Chinese factories 2018
The Verge, MIT's new 'living' jewelry are creepy robot beetles for your clothes 2017
Tech Crunch, MIT's 'living jewelry' is made up of small robot assistants 2017
Curiosity, Project Kino Is "Living" Jewelry That Moves Around Your Body Like An Insect 2017
Adafruit, MIT's Project Kino – Robots Roaming on Clothing #WearableWednesday 2017
HAck'a'Day, Project Kino: robotic jewelry and tech accessory 2017
Digital Trends, MIT's ChainFORM robot transforms into anything from stylus to gaming joystick 2016
Mental Floss, Snake-Like Robot from MIT Is Flexible, Customizable 2016
IEEE Spectrum, MIT's Modular Robotic Chain Is Whatever You Want It to Be 2016
Fast Company, MIT's Weird Snake Bot Is Now Modular And Expandable 2016
Recode, These tiny, wearable robots can cling to your clothes and drive around your body 2016
The New Stack, Rovables Are Tiny Multipurpose Bots That Crawl on Your Clothes 2016
Seeker, Mini Wearable Robots Will Crawl Over Your Body 2016
Wired, The Lingo that'll save your next cocktail party, from 'Rovables' TO 'Manthreading' 2016
Digital Trends, Cute wearable robots will crawl all over your body to do your bidding 2016
How Stuff Works, Rovables: Tiny Robots That Roll on Your Clothes All Day 2016
Medium, Rovables are tiny wearable robots that can roam around your body 2016
Inverse, MIT and Stanford Researchers Just Debuted a Tiny Helper Robot 2016
Robot Globe, Rovables: Wearable Mini Mobile Robots 2016
Popular Science, Tiny Fabric-Clinging Robots Are A Fashion Statement 2016
New Scientist, Roaming fashion robots keep busy doing odd jobs on your clothes 2016
EnGadget, Tiny body-roaming robots could be the future of wearables 2016
Robotic Gizmos, Rovables: Mini Robots That Move On Your Clothes 2016
DailyDot, Tiny robots could become the ultimate wearable of the future 2016
Fast Company, MIT Has Invented The Crazy, Sensor-Loaded Duct Tape Of The Future 2016
Creative Applications, SensorTape – 3D-aware dense sensor network on a roll of tape 2016
Digital Trends, MIT's new sensor-loaded duct tape makes DIY electronics a snap 2016
Popular Mechanics, MIT's Sensor-Laden Masking Tape Gives You Computer By the Foot 2016
CNET, NailO turns your fingernail into a tiny trackpad 2015
Bustle, NailO Is A Nail Sticker That Lets You Use Your Phone Or Computer Wirelessly, Without Touching It 2015
Digital Trends, This amazing gadget turns your thumbnail into a tiny trackpad to control your phone 2015
The Verge, Using this thumbnail trackpad is like playing the world's smallest violin 2015
DailyMail UK, Control your phone with a flick of your fingernail: Researchers reveal tiny trackpad that can be stuck to a thumbnail 2015
Wired, This adorable thumbnail trackpad could actually be useful 2015
New Atlas NailO puts a wireless trackpad on your thumbnail 2015
Phys.org, E-paper display powered by NFC from smartphone 2013
Weekly.com, NFC wirelessly powers bistable ePaper 2013
Pocket-lint, NFC-powered companion E Ink display demonstrated 2013
NFC-World, Researchers demonstrate e-ink display powered by NFC 2013
Tech Briefs, Pixelated E-Paper Display Powered & Updated Wirelessly 2013

TALKS

Shenzhen Design Society Sharing Session, ”Hacking Manufacturing”	April 2018
Hong Kong Design Trust Public Lecture,”Hacking Manufacturing”	August 2017
Hong Kong Citizen Science Fair,”Research Overview”	August 2017
MIT Sidney Pacific Graduate Symposium, ”Rovables”	March 2017
KAIST Research Talk,”Research Overview”	October 2016
Hasso-Plattner-Institut Research Talk, ”Research Overview”	February 2016
TU Berlin Research Talk, ”Research Overview”	February 2016
MIT Museum Living in the Future Series, ”NailO”	September 2015

LANGUAGES

Russian: Native language
English: Fluent
Mandarin: Basic

SKILLS

- **CAD Software**: SolidWorks, Rhino3D
- **Circuit Design**: Altium, Eagle, Cadence
- **Computing software**: MATLAB
- **Programming Languages**: C, C++, C#, Java, Python

REFERENCES

Professor Joseph Paradiso (PhD Advisor)
Media Lab
Massachusetts Institute of Technology, Cambridge, MA
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Professor Joshua Smith (Master’s Advisor)
Department of Computer Science
University of Washington, Seattle, WA
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Professor Hiroshi Ishii (Research Collaborator)
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Professor Christian Holz (Research Collaborator and Supervisor at Microsoft)
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