

# Yasser Khan

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## Summary

I am an engineer/maker/scientist working on multi-disciplinary projects at the intersection of engineering, materials science, biology, and artificial intelligence. My research focuses on additive manufacturing and hardware AI to produce skin-like wearables, implantables, and ingestibles. These medical devices are being used for precision health and psychiatry.

## Research Interests

**Materials and Devices:** wearable/implantable/ingestible electronics, sensors, medical devices, bioelectronics, biophotonics.

**Manufacturing and Systems:** flexible/stretchable/printed/hybrid electronics, additive manufacturing, in-sensor processing, machine learning on edge systems.

**Application:** health/mental health monitoring, precision health/psychiatry.

## Education

**Ph.D. in Electrical Engineering and Computer Sciences** University of California, Berkeley, CA, USA  
GPA 3.95/4.00, Concentration: *Physical Electronics*. Dec '18



Dissertation: Wearable medical sensors enabled by printed bioelectronics and biophotonics.

Advisor: [Professor Ana Claudia Arias](#).

**M.S. in Electrical Engineering** KAUST, KSA  
GPA 3.92/4.00, Concentration: *Optoelectronics and Photonics*. Dec '12



Thesis: Light management in optoelectronic devices with disordered and chaotic structures.

Advisor: [Professor Boon Ooi](#); Co-Advisor: [Professor Andrea Fratalocchi](#).

**B.S. in Electrical Engineering** University of Texas at Dallas, TX, USA  
GPA 3.98/4.00, *Summa Cum Laude*, Concentration: *Electronics*. May '10



Senior Design Project: Wireless embedded control system for atomically precise manufacturing.

Faculty Advisor: [Professor Murat Torlak](#); Industry Advisor: [John Randall, PhD](#).

## Experience

**Assistant Professor of Electrical and Computer Engineering** University of Southern California, CA, USA  
Jan '22–Present



Stanford University, CA, USA

Jan '19–Dec '21

**Stanford**

## Postdoctoral Scholar in Chemical Engineering

- **Wearable sensor system for biochemical analysis of bodily fluids**  
Designed and implemented a wearable sensor system that collects and processes data from a variety of sensors for real-time analysis of bodily fluids.
- **Wearable mental health monitoring platform**  
Developed a skin-like sensor platform that utilizes physiological and chemical sensors to monitor mental health biotypes.
- **Non-invasive ventilator for COVID-19**  
Designed a non-invasive ventilator with a helmet interface that is safe, low-cost, portable, and can provide relief to early-stage COVID-19 patients.

Advisor: [Professor Zhenan Bao](#); Co-Advisor: [Professor Boris Murmann](#).

University of California, Berkeley, CA, USA

Jul '13–Dec '18

**Berkeley**  
UNIVERSITY OF CALIFORNIA

## Ph.D. Student

- **Printed biophotonic sensors for blood and tissue oximetry**  
Demonstrated a flexible organic reflectance oximeter array capable of 2D oxygenation mapping of blood and tissue [1]. Developed the first printed organic optoelectronic sensor for transmission-mode pulse oximetry [3]. Additionally, reported a reflection-mode organic oximeter probe for pulse oximetry on the wrist [10].
- **Printed bioelectronic sensors for electrocardiography (ECG), electromyography (EMG), and bioimpedance spectroscopy**  
Developed a fabrication process for producing thin, printed, and flexible electrode arrays that non-invasively map pressure-induced tissue damage via bioimpedance spectroscopy, even when such damage cannot be visually observed [4, 5]. Also, demonstrated printed electrode arrays for wearable ECG and EMG [3].
- **Integration of printed sensors to flexible hybrid electronics for wearable health monitoring**  
Developed a wearable sensor patch composed of inkjet-printed gold ECG electrodes and a stencil-printed nickel oxide thermistor to record ECG and human body temperature [2].
- **Other Responsibilities:** Designing and maintaining the group website: [arias.berkeley.edu](http://arias.berkeley.edu).

Advisor: [Professor Ana Claudia Arias](#).

University of California, Berkeley, CA, USA

Oct '12–Jun '13

**Berkeley**  
UNIVERSITY OF CALIFORNIA

## Research Intern

- **Printed optoelectronic probe for pulse oximetry**  
Developed hardware and software for interfacing conventional electronics with organic light-emitting diodes (OLEDs) and organic photodiodes (OPDs) for measuring blood oxygen saturation [3].

Advisor: [Professor Ana Claudia Arias](#).

Oxford University, OX, UK

Jul '11–Aug '11

 UNIVERSITY OF OXFORD

## Research Intern

- **Enhancing light scattering and absorption in dye-sensitized solar cells (DSSCs) with air voids in  $TiO_2$  nano-spheres**  
With Mie theory and T-matrix formulation calculated scattering properties of air voids in  $TiO_2$  nano-spheres. Optimized air void sizes and concentrations for greater efficiencies in DSSCs.

Math Advisor: [James Kirkpatrick, PhD](#); Physics Advisor: [Professor Henry Snaith](#).

## Graduate Student Researcher

KAUST, KSA  
Sep '10–Jul '12



- **Energy harvesting in complex systems**  
Experimentally investigated light trapping capabilities of deformed microstructures for energy harvesting [20].
- **Zinc oxide (ZnO) nanorods for simultaneous light trapping and transparent electrode applications in solar cells**  
Studied light concentrating properties of ZnO nanorods, and at the same time evaluated those for using as transparent electrodes [10].
- **Electrochemical etching of tungsten tips for scanning tunneling microscopy (STM) and atomic force microscopy (AFM)**  
Etched ultra-sharp metallic tips for scanning probe microscopy. [19].
- **Other Responsibilities:** Designing and maintaining the group website: [photonics.kaust.edu.sa](http://photonics.kaust.edu.sa).

Advisor: Professor Boon Ooi; Co-Advisor: Professor Andrea Fratalocchi.

## Research Intern

Stanford University, CA, USA

Jul '10–Aug '10

**Stanford**

- **Silver nanowire transparent electrodes for replacing existing Indium Tin Oxide (ITO) transparent electrodes in organic solar cells**  
Worked on solution synthesis to produce 10 $\mu$ m length silver nanowires. Developed a Matlab tool to analyze the electrical response of silver nanowires, and wrote an image processing program for processing SEM images of nanowires.

MSE Advisor: Professor Yi Cui; EE Advisor: Professor Peter Peumans.

## Hardware Design Intern

Zyvex Labs, TX, USA

Jan '10–Jun '10



- **Computer controlled electrochemical etcher to produce extremely sharp tips for use in STM**  
Developed hardware and software for an automated electrochemical tip etcher. Zyvex Labs commercialized the etcher as Zetcher.

Advisor: Joshua Ballard, PhD.

## Successful Co-authored Grant Applications

- \$750,000 funding from National Science Foundation (NSF) for a project proposed by Stanford University to develop "Artificial Intelligence-enabled Multimodal Stress Sensing for Precision Health" 2020–2022
- \$700,000 funding from NextFlex, America's Flexible Hybrid Electronics (FHE) Manufacturing Institute for a project proposed by UC Berkeley, UCSD, and Jabil Circuits to develop "Integration Processes for Flexible and Wearable Wound Monitoring and Therapeutic Bandage" 2017–2018
- \$375,000 funding from Intel Corporation via. Semiconductor Research Corporation Grant No. 2014-IN-2571 for a project proposed by UC Berkeley to develop "Printable and Flexible Electronics for Wearable System Integration" 2015–2017
- \$425,000 funding from Nano-Bio Manufacturing Consortium (NBMC), an industry-academia partnership with the United States Air Force Research Laboratory (AFRL), for a project proposed by Binghamton University, UC Berkeley, and electronics packaging firm i3 Electronics, Inc. (Endicott, N.Y.) to develop "Electronics and Biometric Sensor Platforms for Human Performance Monitoring (HPM)" 2014–2015

## Publications

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Please check [Google Scholar](#) and [Publons](#) for the up-to-date publications list.

### Journal Articles

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- [1] **Yasser Khan**, Donggeon Han, Adrien Pierre, Jonathan Ting, Xingchun Wang, Claire M Lochner, Gianluca Bovo, Nir Yaacobi-Gross, Chris Newsome, Richard Wilson, and Ana C Arias. A flexible organic reflectance oximeter array. *Proceedings of the National Academy of Sciences*, 115(47):E11015–E11024, 2018. doi: [10.1073/pnas.1813053115](https://doi.org/10.1073/pnas.1813053115). URL <http://dx.doi.org/10.1073/pnas.1813053115>. **Media coverage:** [Physics World](#), [UC Berkeley News Center](#), [KCBS Radio](#), [Innovators Magazine](#), [The Engineer \(UK\)](#), [Medgadget](#), [ScienceDaily](#), and many more.
- [2] **Yasser Khan**, Mohit Garg, Qiong Gui, Mark Schadt, Abhinav Gaikwad, Donggeon Han, Natasha AD Yamamoto, Paul Hart, Robert Welte, William Wilson, Steve Czarnecki, Mark Poliks, Zhanpeng Jin, Kanad Ghose, Frank Egitto, James Turner, and Ana C Arias. Flexible hybrid electronics: Direct interfacing of soft and hard electronics for wearable health monitoring. *Advanced Functional Materials*, 26(47):8764–8775, 2016. doi: [10.1002/adfm.201603763](https://doi.org/10.1002/adfm.201603763). URL <http://dx.doi.org/10.1002/adfm.201603763>.
- [3] Claire M Lochner\*, **Yasser Khan\***, Adrien Pierre\*, and Ana C Arias. All-organic optoelectronic sensor for pulse oximetry. *Nature communications*, 5:5745, 2014. doi: [10.1038/ncomms6745](https://doi.org/10.1038/ncomms6745). URL <http://dx.doi.org/10.1038/ncomms6745>. \*Equal contribution. **Media coverage:** [UC Berkeley Grad News](#), [NSF Science 360 News](#), [UC Berkeley News Center](#), [Phys.Org](#), [ScienceDaily](#), [MSN News](#), [Yahoo News](#), and many more.
- [4] **Yasser Khan\***, Felipe J Pavinatto\*, Monica C Lin, Amy Liao, Sarah L Swisher, Kaylee Mann, Vivek Subramanian, Michel M Maharbiz, and Ana C Arias. Inkjet-printed flexible gold electrode arrays for bioelectronic interfaces. *Advanced Functional Materials*, 26(7):1004–1013, 2016. doi: [10.1002/adfm.201503316](https://doi.org/10.1002/adfm.201503316). URL <http://dx.doi.org/10.1002/adfm.201503316>. **Cover article.**
- [5] Sarah L Swisher, Monica C Lin, Amy Liao, Elisabeth J Leeflang, **Yasser Khan**, Felipe J Pavinatto, Kaylee Mann, Agne Naujokas, David Young, Shuvo Roy, Michael R Harrison, Ana C Arias, Vivek Subramanian, and Michel M Maharbiz. Impedance sensing device enables early detection of pressure ulcers in vivo. *Nature communications*, 6:6575, 2015. doi: [10.1038/ncomms7575](https://doi.org/10.1038/ncomms7575). URL <http://dx.doi.org/10.1038/ncomms7575>. **Media coverage:** [BBC News](#), [UC Berkeley News Center](#), [Futurity](#), [NSF News](#), [ACM Communications](#), and many more.
- [6] **Yasser Khan**, Aminy E Ostfeld, Claire M Lochner, Adrien Pierre, and Ana C Arias. Monitoring of vital signs with flexible and wearable medical devices. *Advanced Materials*, 28(22):4373–4395, 2016. doi: [10.1002/adma.201504366](https://doi.org/10.1002/adma.201504366). URL <http://dx.doi.org/10.1002/adma.201504366>.
- [7] **Yasser Khan**, Arno Thielens, Sifat Muin, Jonathan Ting, Carol Baumbauer, and Ana C. Arias. A new frontier of printed electronics: Flexible hybrid electronics. *Advanced Materials*, n/a(n/a):1905279, 2019. doi: [10.1002/adma.201905279](https://doi.org/10.1002/adma.201905279). URL <http://dx.doi.org/10.1002/adma.201905279>.
- [8] **Yasser Khan**, Hossain Mohammad Fahad, Sifat Muin, Hongquan Li, Ray Chang, Karthik Gopalan, Syed Tariq Reza, and Manu Prakash. A low-cost, helmet-based, non-invasive ventilator for covid-19. 2020. URL <https://arxiv.org/abs/2005.11008>.
- [9] **Yasser Khan**, Donggeon Han, Jonathan Ting, Maruf Ahmed, Ramune Nagisetty, and Ana C. Arias. Organic multi-channel optoelectronic sensors for wearable health monitoring. *IEEE Access*, 2019. doi: [10.1109/ACCESS.2019.2939798](https://doi.org/10.1109/ACCESS.2019.2939798). URL <http://dx.doi.org/10.1109/ACCESS.2019.2939798>.

- [10] Donggeon Han, **Yasser Khan**, Jonathan Ting, Simon M King, Nir Yaacobi-Gross, Martin J Humphries, Christopher J Newsome, and Ana C Arias. Flexible blade-coated multicolor polymer light-emitting diodes for optoelectronic sensors. **Advanced Materials**, 29(22):1606206, 2017. doi: [10.1002/adma.201606206](https://doi.org/10.1002/adma.201606206). URL <http://dx.doi.org/10.1002/adma.201606206>.
- [11] Xiaodong Wu, **Yasser Khan**, Jonathan Ting, Juan Zhu, Seiya Ono, Xinxing Zhang, Shixuan Du, James W. Evans, Canhui Lu, and Ana C. Arias. Large-area fabrication of high-performance flexible and wearable pressure sensors. **Advanced Electronic Materials**, n/a(n/a):1901310, 2020. doi: [10.1002/aelm.201901310](https://doi.org/10.1002/aelm.201901310). URL <http://dx.doi.org/10.1002/aelm.201901310>.
- [12] Xiaodong Wu, Maruf Ahmed, **Yasser Khan**, Margaret E. Payne, Juan Zhu, Canhui Lu, James W. Evans, and Ana C. Arias. A potentiometric mechanotransduction mechanism for novel electronic skins. **Science Advances**, 6(30), 2020. doi: [10.1126/sciadv.aba1062](https://doi.org/10.1126/sciadv.aba1062). URL <http://dx.doi.org/10.1126/sciadv.aba1062>.
- [13] Donggeon Han, **Yasser Khan**, Jonathan Ting, Juan Zhu, Craig Combe, Andrew Wadsworth, Iain McCulloch, and Ana C. Arias. Pulse oximetry using organic optoelectronics under ambient light. **Advanced Materials Technologies**, n/a(n/a):1901122, 2020. doi: [10.1002/admt.201901122](https://doi.org/10.1002/admt.201901122). URL <http://dx.doi.org/10.1002/admt.201901122>.
- [14] Donggeon Han, **Yasser Khan**, Karthik Gopalan, Adrien Pierre, and Ana C Arias. Emission area patterning of organic light-emitting diodes (oleds) via printed dielectrics. **Advanced Functional Materials**, 28(37):1802986, 2018. doi: [10.1002/adfm.201802986](https://doi.org/10.1002/adfm.201802986). URL <http://dx.doi.org/10.1002/adfm.201802986>.
- [15] Varun Soman, **Yasser Khan**, Madina Zabran, Mark Schadt, Paul Hart, Michael Shay, Frank Egitto, Konstantinos Papatthomas, Natasha AD Yamamoto, Donggeon Han, Ana C Arias, Kanad Ghose, Mark D Poliks, and James N Turner. Reliability challenges in fabrication of flexible hybrid electronics for human performance monitors: A system level study. **IEEE Transactions on Components, Packaging and Manufacturing Technology**, 2019. doi: [10.1109/TCPMT.2019.2919866](https://doi.org/10.1109/TCPMT.2019.2919866). URL <http://dx.doi.org/10.1109/TCPMT.2019.2919866>.
- [16] Leeya Engel, Chengming Liu, Nofar Mintz Hemed, **Yasser Khan**, Ana Claudia Arias, Yosi Shacham-Diamand, Slava Krylov, and Liwei Lin. Local electrochemical control of hydrogel microactuators in microfluidics. **Journal of Micromechanics and Microengineering**, 28(105005), 2018. doi: [10.1088/1361-6439/aacc31](https://doi.org/10.1088/1361-6439/aacc31). URL <http://dx.doi.org/10.1088/1361-6439/aacc31>.
- [17] Abhinav M Gaikwad, **Yasser Khan**, Aminy E Ostfeld, Shishir Pandya, Sameer Abraham, and Ana Claudia Arias. Identifying orthogonal solvents for solution processed organic transistors. **Organic Electronics**, 30: 18–29, 2016. doi: [10.1016/j.orgel.2015.12.008](https://doi.org/10.1016/j.orgel.2015.12.008). URL <http://dx.doi.org/10.1016/j.orgel.2015.12.008>. Solvents visualization program is available in the Downloads section: <http://arias.berkeley.edu/downloads/>.
- [18] Aminy E Ostfeld, Abhinav M Gaikwad, **Yasser Khan**, and Ana C Arias. High-performance flexible energy storage and harvesting system for wearable electronics. **Scientific reports**, 6:26122, 2016. doi: [10.1038/srep26122](https://doi.org/10.1038/srep26122). URL <http://dx.doi.org/10.1038/srep26122>.
- [19] **Yasser Khan**, Hisham Al-Falih, Yaping Zhang, Tien Khee Ng, and Boon S Ooi. Two-step controllable electrochemical etching of tungsten scanning probe microscopy tips. **Review of Scientific Instruments**, 83(6): 063708, 2012. doi: [10.1063/1.4730045](https://doi.org/10.1063/1.4730045). URL <http://dx.doi.org/10.1063/1.4730045>.
- [20] Changxu Liu, Andrea Di Falco, D Molinari, **Yasser Khan**, Boon S Ooi, Thomas F Krauss, and Andrea Fratalocchi. Enhanced energy storage in chaotic optical resonators. **Nature Photonics**, 7(6):473, 2013. doi: [10.1038/nphoton.2013.108](https://doi.org/10.1038/nphoton.2013.108). URL <http://dx.doi.org/10.1038/nphoton.2013.108>. Cover article. Media coverage: [EurekAlert!](#), [nanowerk](#), [Photonics.com](#), [ScienceDaily](#), [Phys.Org](#), and many more.

- [21] Ali Moin, Andy Zhou, Abbas Rahimi, Alisha Menon, Simone Benatti, George Alexandrov, Senam Tamakloe, Jonathan Ting, Natasha Yamamoto, **Yasser Khan**, Fred Burghardt, Luca Benini, Ana C. Arias, and Jan M. Rabaey. A wearable biosensing system with printed flexible electrodes and in-sensor adaptive learning. 202X. **Nature Electronics**.
- [22] Alla M. Zamarayeva, Natasha A. D. Yamamoto, Anju Toor, Margaret E. Payne, Caleb Woods, Veronika I. Pister, **Yasser Khan**, James W. Evans, and Ana Claudia Arias. Optimization of printed sensors to monitor sodium, ammonium, and lactate in sweat. **APL Materials**, 8(10):100905, 2020. doi: [10.1063/5.0014836](https://doi.org/10.1063/5.0014836). URL <http://dx.doi.org/10.1063/5.0014836>.
- [23] Sara Rachel Arussy Ruth, Vivian Rachel Feig, Min-gu Kim, **Yasser Khan**, Jason Khoi Phong, and Zhenan Bao. Flexible fringe effect capacitive sensors with simultaneous high-performance contact and non-contact sensing capabilities. **Small Structures**, n/a(n/a):2000079, 2020. doi: [10.1002/sstr.202000079](https://doi.org/10.1002/sstr.202000079). URL <http://dx.doi.org/10.1002/sstr.202000079>.
- [24] Jonathan Ting\*, Natasha Yamamoto\*, **Yasser Khan\***, and Ana C Arias. Screen-printed nickel oxide thermistor arrays. 202X. **In preparation**.
- [25] **Yasser Khan\***, Matthew L. Mauriello\*, Parsa Nowruzzi, Nicholas Vitale, Jinxing Li, Jayoung Kim, Akshara Motani, Megan Chesnut, Jan Liphardt, Leanne Williams, Keith D. Sudheimer, Boris Murmann, Zhenan Bao, and Pablo E.Paredes. Design of a mental health wearable: balancing biosignals and human factors. 202X. **In preparation**.
- [26] **Yasser Khan\***, Jayoung Kim\*, Megan Chesnut\*, Nicholas Vitale, Sahar Harati, Matthew L. Mauriello, Parsa Nowruzzi, Jinxing Li, Min gu Kim, Jan Liphardt, Keith D. Sudheimer, Pablo E.Paredes, Leanne Williams, Boris Murmann, and Zhenan Bao. MentaId: a skin-inspired wearable for decoding mental health. 202X. **In preparation**.
- [27] **Yasser Khan\***, Quentin Thiburce\*, Scott Keene\*, Nicholas Vitale, Hongping Yan, Jan Liphardt, Boris Murmann, Alberto Salleo, and Zhenan Bao. Organic electrochemical transistor-based wearable sweat sensing system. 202X. **In preparation**.

## Conference Proceedings

- [1] **Yasser Khan**, Donggeon Han, Adrien Pierre, Jonathan Ting, Xingchun Wang, Claire M. Lochner, and Ana C. Arias. System design for flexible all-organic reflectance oximeter. In *MRS Spring Meeting, Phoenix, AZ, USA*, 2018.
- [2] Donggeon Han, **Yasser Khan**, Karthik Gopalan, and Ana C. Arias. Emission area patterning of blade-coated organic light-emitting diodes (oleds) via printed dielectrics. In *MRS Spring Meeting, Phoenix, AZ, USA*, 2018.
- [3] Ali Moin, Andy Zhou, Abbas Rahimi, Simone Benatti, Alisha Menon, Senam Tamakloe, Jonathan Ting, Natasha Yamamoto, **Yasser Khan**, Fred Burghardt, and others. An emg gesture recognition system with flexible high-density sensors and brain-inspired high-dimensional classifier. In *Circuits and Systems (ISCAS), 2018 IEEE International Symposium on*, pages 1–5. IEEE, 2018. doi: [10.1109/ISCAS.2018.8351613](https://doi.org/10.1109/ISCAS.2018.8351613). URL <http://dx.doi.org/10.1109/ISCAS.2018.8351613>.
- [4] Mark Poliks, James Turner, Kanad Ghose, Zhanpeng Jin, Mohit Garg, Qiong Gui, Ana Arias, Yasser Kahn, Mark Schadt, and Frank Egitto. A wearable flexible hybrid electronics ecg monitor. In *Electronic Components and*



*Technology Conference (ECTC), 2016 IEEE 66th*, pages 1623–1631. IEEE, 2016. doi: [10.1109/ECTC.2016.395](https://doi.org/10.1109/ECTC.2016.395). URL <http://dx.doi.org/10.1109/ECTC.2016.395>.

- [5] Y. Khan and A. C. Arias. Flexible electrode arrays for bioelectronic interfaces. In *Flexible and Printed Electronics Conference, CA, USA*, 2016.
- [6] Yasser Khan, Mark Schadt, Mohit Garg, Qiong Gui, Paul Hart, Robert Welte, Stephen Cain, Bill Wilson, Zhanpeng Jin, Mark Poliks, Kanad Ghose, Steve Czarnecki, Frank Egitto, James Turner, and Ana Claudia Arias. Inkjet-printed sensors for wearable health monitoring. In *MRS Fall Meeting, Boston, MA, USA*, 2015. **Best Oral Presentation Award**.
- [7] Y. Khan, M. Garg, M. Schadt, Q. Gui, P. Hart, Z. Jin, M. Poliks, R. Welte, S. Czarnecki, F. Egitto, K. Ghose, J. Turner, and A. C. Arias. Interfacing printed sensors to conventional electronics for wearable sensor patch. In *Flexible and Printed Electronics Conference, CA, USA*, 2015.
- [8] Amy Liao, Monica C Lin, Lauren C Ritz, Sarah L Swisher, David Ni, Kaylee Mann, Yasser Khan, Shuvo Roy, Michael R Harrison, Ana C Arias, Vivek Subramanian, David Young, and Michel M Maharbiz. Impedance sensing device for monitoring ulcer healing in human patients. In *Engineering in Medicine and Biology Society (EMBC), 2015 37th Annual International Conference of the IEEE*, pages 5130–5133. IEEE, 2015. doi: [10.1109/EMBC.2015.7319546](https://doi.org/10.1109/EMBC.2015.7319546). URL <http://dx.doi.org/10.1109/EMBC.2015.7319546>.
- [9] Yasser Khan, Adrien Pierre, Claire Lochner, and Ana C. Arias. All-organic green light pulse oximeter for wearable medical sensing. In *MRS Fall Meeting, Boston, MA, USA*, 2014.
- [10] Yasser Khan, Yaping Zhang, Muhammad Amin, A Bayraktaroglu, Tien Khee Ng, H Bağcı, J Phillips, and Boon S Ooi. ZnO nanorods for simultaneous light trapping and transparent electrode application in solar cells. In *Photonics Conference (PHO), 2011 IEEE*, pages 619–620. IEEE, 2011. doi: [10.1109/PHO.2011.6110700](https://doi.org/10.1109/PHO.2011.6110700). URL <http://dx.doi.org/10.1109/PHO.2011.6110700>.
- [11] Hisham Al-Falih, Yasser Khan, Yaping Zhang, Damain Pablo San-Roman-Alerigi, Dongkyu Cha, Boon Siew Ooi, and Tien Khee Ng. Fabrication of tuning-fork based afm and stm tungsten probe. In *High Capacity Optical Networks and Enabling Technologies (HONET), 2011*, pages 190–192. IEEE, 2011. doi: [10.1109/HONET.2011.6149815](https://doi.org/10.1109/HONET.2011.6149815). URL <http://dx.doi.org/10.1109/HONET.2011.6149815>.
- [12] Yasser Khan, Josh Ballard, Yaping Zhang, Justin Alexander, Miles Larkin, and Boon Ooi. Facile method for fabricating reproducible tungsten probe tips with varying cone angles. In *International Conference on Materials for Advanced Technologies (ICMAT)*, 2011.
- [13] Yasser Khan and John Randall. Wireless embedded control system for atomically precise manufacturing. In *Information Technology: New Generations (ITNG), 2011 Eighth International Conference on*, pages 965–969. IEEE, 2011. doi: [10.1109/ITNG.2011.165](https://doi.org/10.1109/ITNG.2011.165). URL <http://dx.doi.org/10.1109/ITNG.2011.165>.

## Poster Presentations

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- [1] Yasser Khan, Boris Murmann, and Zhenan Bao. Mentaïd: A skin-like sensor system for decoding mental health. In *2020 eWEAR Annual Meeting, Stanford, CA, USA*, February 2020.
- [2] Jonathan Ting\*, Natasha Yamamoto\*, Yasser Khan\*, Abhinav Gaikwad, and Ana Claudia Arias. Fully screen-printed nio thermistor arrays. In *Flexible Electronics Conference and Exhibition - 2018 FLEX, Monterey, CA, USA*, February 2018. **Best Poster Award**.

- [3] **Yasser Khan**, Felipe Pavinatto, and Ana Claudia Arias. Flexible printed circuit board for wearable physiological monitoring. In *MRS Spring Meeting, San Francisco, CA, USA*, April 2014. **Nominated for Best Poster Award.**
- [4] **Yasser Khan**, Adrien Pierre, Claire Lochner, and Ana Claudia Arias. Printed pulse oximeter for wearable medical sensor patch. In *NASCENT IAB Meeting, Austin, TX, USA.*, January 2014. **Best Poster Award.**
- [5] **Yasser Khan**, Changxu Liu, Diego Molinari, Boon Ooi, and Andrea Fratolocchi. Energy harvesting in complex systems. In *Electrical Engineering Days, King Abdullah University of Science and Technology.*, February 2012. **Best Poster Award.**
- [6] **Yasser Khan**, Josh Ballard, Justin Alexander, Miles Larkin, and Boon Ooi. Controllable electrochemical etching of tungsten stm tips. In *First WEP Research Poster Session, King Abdullah University of Science and Technology.*, January 2011. **Best Poster Award.**
- [7] **Yasser Khan**, Yaping Zhang, Muhammad Amin, Tien Khee Ng, Jamie Phillips, Hakan Bagci, and Boon Ooi. ZnO nanorods for simultaneous light trapping and transparent electrode application in solar cells. In *First Graduate Research Symposium, King Abdullah University of Science and Technology.*, May 2011. **Best Poster Award.**

## Patents

- [1] Ana Claudia Arias, Claire Lochner, Adrien Pierre, and **Yasser Khan**. Reflectance based pulse oximetry systems and methods, February 4 2020. US Patent 10,548,519.
- [2] Michel Maharbiz, Vivek Subramanian, Ana Claudia Arias, Sarah Swisher, Amy Liao, Monica Lin, Felipe Pavinatto, **Yasser Khan**, Daniel Cohen, Elisabeth Leeflang, and others. Methods and apparatus for monitoring wound healing using impedance spectroscopy, November 5 2019. US Patent 10,463,293.
- [3] Claire Meyer Lochner, Rachel Nancollas, Jacob Sadie, **Yasser Khan**, and Ana Claudia Arias. Flexible, non-invasive real-time hematoma monitoring system using near-infrared spectroscopy, May 3 2018. US Patent App. 15/852,366.
- [4] **Yasser Khan**, Donggeon Han, Adrien Pierre, Jonathan Ting, Xingchun Wang, Claire M Lochner, and Ana C Arias. Printed all-organic reflectance oximeter array, November 28 2019. International Patent App. PCT/US20 19/033381.

## Invited Talks

- [1] **Yasser Khan**. A low-cost, helmet-based, non-invasive ventilator for covid-19, May 2020. eWear Seminar, Stanford University.
- [2] **Yasser Khan**. Mentaïd: A skin-like sensor system for decoding mental health, January 2020. Catalyst Symposium on Mental Health, Stanford University.
- [3] **Yasser Khan**. Soft, skin-like, organic optoelectronic sensors for wearable oximetry, June 2019. eWear Seminar, Stanford University.
- [4] **Yasser Khan**. Wearable medical sensors enabled by printed bioelectronics and biophotonics, December 2018. Kateeva.



- [5] **Yasser Khan.** Integration of printed sensors to flexible hybrid electronics for wearable health monitoring, March 2018. University of Southern California.
- [6] **Yasser Khan.** Integration of printed sensors to flexible hybrid electronics for wearable health monitoring, February 2018. Purdue University.

## Selected News Coverage

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- [1] Medical Device Developments. Your heart on your sleeve. URL <https://secure.viewer.zmags.com/publication/d864f5ef#/d864f5ef/70>.
- [2] Physics World. Flexible sensor maps blood oxygen levels. URL <https://physicsworld.com/a/flexible-sensor-maps-blood-oxygen-levels/>.
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## Honors and Distinctions

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### Research Awards / Honors:

Best Poster Award, Flex 2018 Conference, Monterey, CA, USA	<i>Feb '18</i>
Best Project Award, Systems On Nanoscale Information fabriCs (SONIC) Year 5 Annual Review Meeting, Urbana, IL, USA	<i>Oct '17</i>
Best Oral Presentation Award, MRS Fall Meeting, Boston, MA, USA	<i>Dec '15</i>
Best Poster Award, NASCENT IAB Meeting, UT Austin, TX, USA	<i>Jan '14</i>
Best Poster Award, EE – Photonics Track, Electrical Engineering Days, KAUST	<i>Feb '12</i>
Finalist, DOW Sustainability Innovation Student Challenge	<i>Sep '11</i>

Best Poster Award, First Graduate Research Symposium, KAUST May '11  
 Best Poster Award, Winter Enrichment Period Research Poster Session, KAUST Jan '11

### Academic Awards / Honors:

EECS Departmental Fellowship, UC Berkeley Sep '13  
 Academic Excellence Award, (Top 5% in Graduating Class), KAUST Dec '11  
 KAUST Provost Award, (Top 15% in Matriculating Class), KAUST Nov '10  
 KAUST Graduate Fellowship May '10  
 Phi Kappa Phi, Honor Society, (Top 10% in Graduating Class), UT Dallas May '10  
 Dean's List, All Semesters, (Top 10% in Erik Jonsson School of ECS), UT Dallas May '10  
 Golden Key Honor Society, (Top 15% in School of ECS), UT Dallas Dec '09  
 KAUST Discovery Scholarship Oct '08  
 Academic Excellence Scholarship, UT Dallas Apr '08  
 Undergraduate Scholarship for three years, OIC May '05  
 Merit Scholarships, Education Board, Government of Bangladesh, (Top 1% in Graduating Class) Dec '01, '03, '05

## Technical skills

### Fabrication and Characterization:

**Fabrication:** Dimatix, Ceradrop, Screen Printing, Auto-Matic Film Applicator. **Microscopy:** SEM – FEI Quanta 600, Confocal Microscopy, AFM, TEM.  
**Optical Characterization:** UV-Vis, Raman and PL – Horiba, Ellipsometry. **Electrical Characterization:** Cascade, B1500A Semiconductor Device Parameter Analyzer.

### Software Skills:

**Programming:** C/C++, Python, Matlab. **Open-Source:** MEEP, LAMMPS, Paraview, MSTM, Voro++,  $\text{\LaTeX}$ , Git.  
**OS:** Unix, Ubuntu, Windows. **Software Applications:** Comsol, L-Edit, SEMulator3D.

### Hardware Skills:

**Prototyping and PCB:** Eagle. **MCUs and MPUs:** Arduino, Gumstix, MSP 430, Nordic nRF51.

## Professional Activities

Reviewer, Nature Electronics, Nature Communications '14 – Present  
 Reviewer, Proceedings of the National Academy of Sciences, PNAS '15 – Present  
 Reviewer, Science Advances '19 – Present  
 Reviewer, ACS Nano '19 – Present  
 Reviewer, Advanced Optical Materials, Advanced Engineering Materials '19 – Present  
 Reviewer, IEEE Sensors Journal, IEEE Sensors Letters, IEEE Transactions of Electron Devices '13 – Present  
 Reviewer, AIP Advances '10 – Present  
 Materials Research Society (MRS), Student Member '13 – Present  
 Institute of Electrical and Electronics Engineers (IEEE), Student Member '06 – '10  
 American Physical Society (APS), Student Member '09 – '10

## Relevant Graduate Courses

**Semiconductor Devices:** Integrated-Circuit Devices, Solid State Devices, Electronic and Optical Properties of Semiconductors. **Optoelectronics and Photonics:** Semiconductor Optoelectronic Devices, Semiconductor Lasers and LEDs, Photonics, Advanced Topics in Wave Propagation.

**Bioelectronics:** Introductory Electronic Transducers Laboratory, Brain–Machine Interface Systems.      **Biophotonics:** Principles of Molecular and Cellular Biophotonics.

## Teaching

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Lab / Content TA, EE 16A, Designing Information Devices and Systems I, UC Berkeley	<i>Fall '17</i>
Lab / Content TA, EE 16A, Designing Information Devices and Systems I, UC Berkeley	<i>Spring '17</i>
Lab TA, EE 306, Electronic and Optical Properties of Semiconductors, KAUST	<i>Fall '12</i>

## References

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Available upon request.