

Vivek Subramanian

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13809 Research Blvd Suite 500
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Austin, TX 78750, USA

Education

3 / 96 - 6 / 98

Ph.D. in Electrical Engineering, Stanford University *Stanford, California*

Honors earned: Graduate Fellowship, Eastman Kodak Company

9 / 94 - 3 / 96

MS in Electrical Engineering, Stanford University *Stanford, California*

8 / 90 - 5 / 94

BS in Electrical Engineering, Louisiana State University *Baton Rouge, Louisiana*

Honors earned: Summa cum laude, College Honors, Outstanding Senior, Junior and Sophomore, Honors College

Professional Experience

2018 - present

École polytechnique fédérale de Lausanne *Switzerland*

8/18 – present: Professor of Microengineering

2000 - present

Department of Electrical Engineering & Computer Sciences, University of California *Berkeley, CA*

7/20 to date: Adjunct Professor

7/18 – 6/20: Chancellor's Professor

7/11 – 6/20: Professor

7/05 – 7/11: Associate Professor

7/00-7/05: Assistant Professor

Research, teaching and service in EECS Department

Honors Earned:

2015 IEEE Kiyo Tomiyasu Award

Best in session and best in track awards, 2013 IMAPS Microelectronics Conference

Outstanding paper award, 2012 IMAPS Microelectronics Conference

2008 Printed Electronics Champion, Printed Electronics USA Conference, November 2008

Outstanding Teaching Award, EECS Department, UC Berkeley, 2005

Best paper award, 2004 IEEE Device Research Conference

Nominated to MIT's Technology Review top 100 young innovators list (TR100), 2002

National Science Foundation Young Investigator (CAREER) Award, FY2002,

Nominated to National Academy of Engineering's *Frontiers of Engineering*, 2002

Winner of 2002 Paul Rappaport Award for best paper in an IEEE EDS Journal

2009 - present

Adjunct Professor, Sunchon National University

Sunchon, Korea

2013 to date: Adjunct Professor, BK21 Program

2009-2013: Adjunct Professor and Principal Investigator, WCU Program

Initiated, managed, and contributed to large multinational research program focused on printed electronics, including displays, energy devices, and RFID

2000 - present

Independent Consultant

Orinda, CA

Consultant to the semiconductor industry and its associated fields in the following areas:

Memory technology and design, Silicon Process Technology

Display / Imager and Flexible Electronics Technology, RFID Technology

Intellectual Property Consulting

Technology Evaluation / Venture Capital due diligence

2014- present

	<p>Founder and CTO, Locix Inc. <i>San Bruno, CA</i> <i>Senior leadership role in venture-funded startup company working on wireless networking</i></p>
2004 – 2013	<p>Founding Scientific Advisor, Kovio, Inc. <i>Sunnyvale, CA</i> <i>Scientific advising to printed electronics startup company</i></p>
2008 - 2011	<p>Chief Technical Advisor, QuSwami, Inc. <i>San Francisco, CA</i> <i>Scientific advising to energy conversion device startup company</i> Served as CTO from July 2010-June 2011</p>
1998 - 2000	<p>Consulting Assistant Professor, Electrical Engineering Department, Stanford University. <i>Stanford, CA</i> Advisory role for research group of Prof. Krishna C. Saraswat</p>
1998-2000	<p>Visiting Research Engineer, Electrical Engineering Department, University of California. <i>Berkeley, CA</i> Research into 25nm MOSFET technologies for giga-scale integration</p>
1998 - 2000	<p>Founder, Matrix Semiconductor, Inc. <i>Santa Clara, CA</i> Co-founder and technical advisor of startup company working on high-density memory technology</p> <p>Honors Earned: Nominated to Scientific American's SA50 List for Visionary Technology Finalist for 2003 World Technology Award for Information Technology Hardware Winner, 2005 EDN Innovation Award</p>
1998	<p>Co-instructor, Electrical Engineering Department, Stanford University. <i>Stanford, CA</i> Co-teaching of EE311, Advanced Integrated Circuit Fabrication Processes</p>
1997	<p>Intern, Advanced Product Research and Development Laboratory, Motorola Inc. <i>Austin, TX</i> Research into process development issues affecting SiGe SEMFET devices</p>
1996	<p>Head Teaching Assistant EE410: IC Fabrication Laboratory, Stanford University <i>Stanford, CA</i> Coordination and instruction of EE410, graduate level laboratory course.</p>
1994-1998	<p>Research Assistant, Electrical Engineering, Stanford University <i>Stanford, CA</i> Research into crystallization of amorphous Si and SiGe films using low thermal budget processes.</p>
	<p>Professional Affiliations and Activities</p> <p>Technical Program Committee, IEEE Electronic Components and Technology Conference, 2014 to 2016 Chair, Scientific Advisory Board, iPACK, Royal Institute of Technology (KTH), Sweden, 2011 to 2016 Tampere Institute of Technology Faculty Search Committee, Finland, 2013 University of Oulu Faculty Search Committee, Finland, 2013 Served as external thesis committee member for several universities world-wide, including University of Cape Town (South Africa), Tampere Institute of Technology (Finland), Technical University of Eindhoven (Netherlands), Indian Institute of Science (India), Indian Institute of Technology (India), 2009 to date Associate Editor, IEEE Journal of Display Technology, 2008 to date Technical Program Chair, Large Area, Organic, and Printed Electronics Conference, 2012-2013 Scientific Committee, Large Area, Organic, and Printed Electronics Conference, 2009-2011 Scientific Committee, International Conference on Printed and Flexible Electronics, 2009-2013 IEEE Electron Devices Society Organic Electronics Committee, 2003 - 2005 Executive Committee, International Electron Device Meeting, 2003 to 2009 Technical Program Committee, International Electron Device Meeting, 2001-2002 Technical Program Committee member, Device Research Conference, 2000-2002 Technical Program Committee member, VLSI-TSA Conference, 2005 Member, Institute of Electrical and Electronic Engineers</p>

List of Patents, Publications and Presentations

Patents

1. “Systems and methods for using ranging to determine locations of wireless sensor nodes based on radio frequency communications between the nodes and various RF-enabled devices”, T. Ylamurto, M. Seth, L. Kong, V. Subramanian, US Patent 10,551,479
2. “Systems and methods for providing communications within wireless sensor networks based on a periodic beacon signal”, T. Ylamurto, V. Pavate, E. Alon, V. Subramanian, US Patent 10,536,901
3. “Systems and methods for using radio frequency signals and sensors to monitor environments”, T. Bakhishev, V. Subramanian, V. Pavate T. Ylamurto, US Patent 10,514,704.
4. “Systems and methods for using radio frequency signals and sensors to monitor environments”, T. Bakhishev, V. Subramanian, V. Pavate T. Ylamurto, US Patent 10,504,364
5. “Systems and methods for coarse and fine time of flight estimates for precise radio frequency localization in the presence of multiple communication paths”, M. Seth, L. Kong, T. Ylamurto, V. Subramanian, US Patent 10,470,156
6. “Methods and apparatus for monitoring wound healing using impedance spectroscopy”, M. Maharbiz, V. Subramanian, A. C. Arias, S. Swisher, A. Liao, M. Lin, F. Pavinatto, Y. Khan, D. Cohen, E. Leeftang, S. Roy, M. Harrison, D. Young, US Patent 10,463,293
7. “Systems and methods for using radio frequency signals and sensors to monitor environments”, T. Bakhishev, V. Subramanian, V. Pavate T. Ylamurto, US Patent 10,156,852.
8. “Systems and methods for determining locations of wireless sensor nodes in a tree network architecture having mesh-based features”, L. Kong, T. Bakhishev, T. Ylamurto, V. Subramanian, M. Seth, US Patent 10,104,508.
9. “Systems and methods for providing wireless asymmetric network architectures of wireless devices with power management features”, V. Subramanian, E. Alon, V. Pavate, US Patent 10,028,220.
10. “Random delay generation for thin-film transistor based circuits”, V Subramanian, M Mao, Z Wang, US Patent 9,985,664
11. “Systems and methods for determining locations of wireless sensor nodes in a network architecture having mesh-based features for localization”, L. Kong, T. Bakhishev, T. Ylamurto, V. Subramanian, M. Seth, US Patent 9,846,220
12. “Systems and methods for determining locations of wireless sensor nodes in a tree network architecture having mesh-based features”, L. Kong, T. Bakhishev, T. Ylamurto, V. Subramanian, M. Seth, US Patent 9,763,054
13. “Through silicon vias and thermocompression bonding using inkjet-printed nanoparticles”, V. Subramanian and J. Sadie, US Patent 9,717,145
14. “Systems and methods for providing wireless asymmetric network architectures of wireless devices with anti-collision features”, V. Subramanian, E. Alon, V. Pavate, US Patent 9,706,489
15. “Systems and methods for determining locations of wireless sensor nodes in an asymmetric network architecture”, V. Subramanian, E. Alon, V. Pavate, US Patent 9,529,076
16. “Systems and methods for providing wireless sensor networks with an asymmetric network architecture”, V. Subramanian, E. Alon, V. Pavate, US Patent 9,380,531
17. “Transparent metal oxide nanoparticle compositions, methods of manufacture thereof and articles comprising the same”, V. Subramanian, S. K. Volkman, US Patent 9,343,202
18. “Three-dimensional nonvolatile memory and method of fabrication”, M. G. Johnson, T. H. Lee, V. Subramanian, P. M. Farmwald, J. M. Cleaves, US Patent 9,214,243
19. “Dense arrays and charge storage devices”, T. H. Lee, V. Subramanian, J. M. Cleaves, I. G. Kouznetsov, M. G. Johnson, P. M. Farmwald, US Patent 9,171,857
20. “Print compatible designs and layout schemes for printed electronics”, Z. Wang, V. Subramanian, L. Cleveland, US Patent 9,155,202
21. “Wireless devices including printed integrated circuitry and methods for manufacturing and using the same”, P. Smith, C. Choi, V. Pavate, J. M. Cleaves, V. Subramanian, R. Young, V. Biviano, US Patent 9,004,366.

22. "Dense arrays and charge storage devices", T. H. Lee, V. Subramanian, J. M. Cleeves, M. G. Johnson, P. M. Farmwald, I. Kouznetsov, US Patent, 8,981,457.
23. "High reliability surveillance and/or identification tag/devices and methods of making and using the same", V. Subramanian, P. Smith, V. Pavate, A. Kamath, C. Choi, A. Chandra, J. M. Cleeves, US Patent, 8,933,806.
24. "Surveillance devices with multiple capacitors", P. Smith, C. Choi, J. M. Cleeves, V. Subramanian, A. Kamath, S. Moles, US Patent, 8,912,890.
25. "Pillar-shaped nonvolatile memory and method of fabrication", M. G. Johnson, T. H. Lee, V. Subramanian, P. M. Farmwald, J. M. Cleeves, US Patent 8,897,056
26. "Dense arrays and charge storage devices", T. H. Lee, V. Subramanian, J. M. Cleeves, I. G. Kouznetsov, M. G. Johnson, P. M. Farmwald, US Patent 8,853,765
27. "Dense arrays and charge storage devices", T. H. Lee, V. Subramanian, J. M. Cleeves, I. G. Kouznetsov, M. G. Johnson, P. M. Farmwald, US Patent 8,823,076
28. "Random delay generation for thin-film transistor based circuits", V. Subramanian, M. Mao, Z. Wang, US Patent 8,810,298
29. "Vertically stacked field programmable nonvolatile memory and method of fabrication", M. Johnson, T. Lee, V. Subramanian, M. Farmwald, and J. M. Cleeves, US Patent 8,503,215
30. "Process-variation tolerant series-connected NMOS and PMOS diodes, and standard cells, tags, and sensors containing the same", V. Subramanian, P. Smith, US Patent 8,471,308
31. "Printed compatible designs and layout schemes for printed electronics", Z. Wang, V. Subramanian, L. Cleveland, US Patent 8,383,952
32. "Method for making surveillance devices with multiple capacitors", P. Smith, C. Choi, J. M. Cleeves, V. Subramanian, A. Kamath, S. Moles, US Patent 8,296,943
33. "High reliability surveillance and/or identification tag/devices and methods of making and using the same", V. Subramanian, P. Smith, V. Pavate, A. Kamath, C. Choi, A. Chandra, and J. M. Cleeves, US Patent 8,264,359
34. "High reliability surveillance and/or identification tag/devices and methods of making and using the same", V. Subramanian, P. Smith, V. Pavate, A. Kamath, C. Choi, A. Chandra, and J. M. Cleeves, US Patent 8,227,320
35. "Vertically stacked field programmable nonvolatile memory and method of fabrication", M. Johnson, T. Lee, V. Subramanian, M. Farmwald, and J. M. Cleeves, US Patent 8,208,282
36. "Reliable tag deactivation", J. M. Cleeves, V. Subramanian, US Patent 8,138,921
37. "Combined static and dynamic frequency divider chains using thin film transistors", V. Subramanian, US Patent 8,085,068
38. "Process-variation tolerant diode, standard cells including the same, tags and sensors containing the same, and methods for manufacturing the same", V. Subramanian, P. Smith, US Patent 7,932,537
39. "Three terminal nonvolatile memory Device with vertical gated diode", T. H. Lee, V. Subramanian, J. M. Cleeves, M. G. Johnson, P. M. Farmwald, I. G. Kouznetsov, US Patent 7,825,455
40. "Vertically stacked field programmable nonvolatile memory and method of fabrication", V. Subramanian, J. M. Cleeves, US Patent 7,816,189
41. "Multi-mode tags and methods of making and using the same", P. Smith, J. M. Cleeves, V. Pavate, V. Subramanian, US Patent 7,750,792
42. "Method of manufacturing complementary diodes", V. Subramanian, P. Smith, US Patent 7,528,017
43. "Vertically stacked field programmable nonvolatile memory and method of fabrication", V. Subramanian, J. M. Cleeves, US Patent 7,319,053
44. "Vertically stacked field programmable nonvolatile memory and method of fabrication", V. Subramanian, J. M. Cleeves, US Patent 7,265,000
45. "Vertically stacked field programmable nonvolatile memory and method of fabrication", V. Subramanian, J. M. Cleeves, US Patent 7,160,761
46. "Vertically stacked field programmable nonvolatile memory and method of fabrication", V. Subramanian, J. M. Cleeves, US Patent 7,157,314

47. "Dense arrays and charge storage devices", T. H. Lee, V. Subramanian, J. M. Cleaves, A. J. Walker, C. Petti, I. Kouznetzov, M. G. Johnson, P. M. Farmwald. B. Herner, US Patent 7129538
48. "Patterning three dimensional structures", C. K. Li, J. N. Knall, M. A. Vyvoda, J. M. Cleaves, V. Subramanian, US Patent 7071565
49. "Monolithic three dimensional array of charge storage devices containing a planarized layer", T. H. Lee, V. Subramanian, J. M. Cleaves, A. J. Walker, C. J. Petti, I. G. Kouznetzov, M. G. Johnson, P. M. Farmwald, and B. Herner, US Patent 6881994
50. "Thermal processing for three dimensional circuits", V. Subramanian, J. M. Cleaves, J. N. Knall, C. K. Li, and M. A. Vyvoda, US Patent 6,770,939
51. "Vertically stacked field programmable nonvolatile memory and method of fabrication", M. G. Johnson, T. H. Lee, V. Subramanian, and P. M. Farmwald, US Patent 6780711
52. "Multigate semiconductor device with vertical channel current and method of fabrication", J. M. Cleaves and V. Subramanian, US Patent 6677204
53. "Thermal processing for three dimensional circuits", V. Subramanian, J. M. Cleaves, J. N. Knall, C. K. Li, and M. A. Vyvoda, US Patent 6624011
54. "Multigate semiconductor device with vertical channel current and method of fabrication", J. M. Cleaves and V. Subramanian, US Patent 6580124
55. "Patterning three dimensional structures", C. K. Li, J. N. Knall, M. A. Vyvoda, J. M. Cleaves, and V. Subramanian, US Patent 6627530
56. "Low cost three-dimensional memory array", M. Johnson, T. Lee, V. Subramanian, P. Farmwald, J. Knall, US Patent 6515888
57. "Integrated circuit structure including three-dimensional memory array", M. Johnson, T. Lee, V. Subramanian, P. M. Farmwald, J. M. Cleaves, US Patent 6385074.
58. "FINFET transistor structures having double gate channel extending vertically from a substrate and methods of manufacture", C. Hu, T-J. King, V. Subramanian, L. Chang, X. Huang, Y-K. Choi, J. T. Kedzierski, N. Lindert, J. Bokor, W-C. Lee, US Patent 6413802
59. "Vertically stacked field programmable nonvolatile memory and method of fabrication", M. Johnson, T. Lee, V. Subramanian, M. Farmwald, and J. M. Cleaves, US Patent 6185122.
60. "Vertically Stacked Field Programmable Nonvolatile Memory and Method of Fabrication", M. Johnson, T. Lee, V. Subramanian, M. Farmwald, and J. M. Cleaves, US Patent 6034882.
61. "Vertically Stacked Field Programmable Nonvolatile Memory and Method of Fabrication", M. Johnson, T. Lee, V. Subramanian, M. Farmwald, and J. M. Cleaves, US Patent 6351406.
62. "Vertically Stacked Field Programmable Nonvolatile Memory and Method of Fabrication", M. Johnson, T. Lee, V. Subramanian, M. Farmwald, and J. M. Cleaves, US Patent 6483736.

Invited Magazine Articles, Books, Chapters, and Monographs

1. Chapter in "Inkjet Technology for Digital Fabrication", Editors: Ian M. Hutchings, Graham D. Martin, Wiley, ISBN: 978-0470681985
2. Chapter in "Applications of Organic and Printed Electronics: A Technology-Enabled Revolution (Integrated Circuits and Systems), Editor: E. Cantatore, ISB: 978-1-461-43159-6
3. Chapter in "Inkjet-based Micromanufacturing", Editors: Korvink, Smith, Shin, Wiley, ISBN: 978-3-527-31904-6
4. Chapter in "Organic Electronics II. More Materials and Applications", Editor: H. Klauk, Wiley, ISBN: 978-3-527-32647-1
5. Chapter in "Transparent Electronics: From Synthesis to Applications", Editors: A. Facchetti and T. Marks, Wiley, ISBN: 978-0-470-99077-3, 2010.
6. Chapter in "The chemistry of inkjet inks", Editor: S. Magdassi, World Scientific Publishing Company, ISBN: 978-9812818218, 2009
7. Chapter in "Organic Field-Effect Transistors", Editors: Z. Bao, and J. Locklin, CRC Press, ISBN: 978-0849380808, 2007

8. “Developments in printed RFID”, V. Subramanian, Pira Publishing, UK, 2006.
9. “3D Chips: Future Possibilities”, V. Subramanian, Silicon India, Feb 2003, pp. 24-25

Invited Conference Presentations

1. **Invited**, “Materials, Process, and Device Innovations for High-Performance Printed Electronics”, PRINSE’18 – The 5th Printed Intelligence Industry Seminar on Manufacturing Solutions for Customer Needs and Vision to the Future, Oulu, Finland, Jan 31-Feb 1, 2018.
2. **Invited**, “Highly scaled gravure printed organic transistors for high-performance printed organic electronics”, High-frequency printed and direct-written organic-hybrid integrated circuits (HEROIC) Workshop, Milan, Italy, Nov 8-10, 2017.
3. **Keynote**, “Printed Electronics: Innovations in Materials, Processes, and Devices”, Association of International Metallizers, Coaters, and Laminators (AIMCAL) R2R Conference USA 2017, Tampa, FL, Oct-15-18, 2017.
4. **Invited**, “High-performance gravure printed organic transistors”, 2017 European Materials Research Society Meeting, Strasbourg, France, May 22-26, 2017
5. **Invited**, “Printed Electronics: Innovations in Materials, Processes, and Devices”, 2017 International Thin Film Transistor Conference (ITC 2017), Austin, TX, February 23-24, 2017.
6. **Invited**, “High-speed Printing of Transistors: From Inks to Devices”, 2016 International Society of Coating Science and Technology Symposium (ISCST), Pittsburgh, PA, September 18-21, 2016.
7. **Keynote**, “Printed Electronics: Innovations in Materials, Processes, and Devices”, 2016 Canadian Printable Flexible Wearable electronics Symposium (CPES2016), April 19-20, Oakville, Canada
8. **Keynote**, “Printed Electronics: Innovations in Materials, Processes, and Device”, 2016 Society of Vacuum Coaters Techcon, Indianapolis, IN, May 10-13, 2016.
9. **Invited**, Subramanian, Vivek, Chung, Seungjun, Grau, Gerd and Scheideler, William J., “71-2: Invited Paper: Printed Transistors and MEMS for Large-Area Electronics”, 2016 Society for Information Display Symposium, San Francisco, May 20-27, 2016.
10. **Keynote**, “Printed Electronics: Innovations in Materials, Processes, and Devices”, 31st Philippine Chemistry Congress, Iloilo, Philippines, April 13-15, 2016.
11. **Keynote**, “Advanced Processes, Materials, and Devices for Emerging Printed Electronics Applications”, 3rd Swiss Conference on Printed Electronics and Functional Materials, Neuchatel, Switzerland, Oct 1-2, 2015.
12. **Invited**, “High-performance printed organic transistors: Materials, processes, and devices”, V. Subramanian, G. Grau, H. Kang, and R. Kitsomboonloha, 2015 American Chemical Society National Meeting and Exposition, Boston, MA, Aug 17th, 2015.
13. **Invited**, Subramanian, Vivek, Jaewon Jang, William Scheideler, and Sarah Swisher. “39.1: Invited Paper: Printed Inorganic Transistors Based on Transparent Oxides.” In SID Symposium Digest of Technical Papers, vol. 46, no. 1, pp. 587-590. 2015.
14. **Plenary**, “Printed Electronics: Advanced Technologies Enabling New Applications”, 2015 Flexible and Printed Electronics Conference, Monterey, CA, February 23-26, 2015.
15. **Invited**, “High-resolution gravure printing of organic thin film transistors for high-performance printed electronic systems”, V. Subramanian, R. Kitsomboonloha, J. Cen, H. Kang, G. Grau, and W. J. Scheideler, Materials Research Society Fall Meeting, Boston, MA, Dec 3, 2014.
16. **Invited**, “Advanced printed electronics technologies for novel ubiquitous human interactive systems”, 2014 CMOS Emerging Technologies Research Symposium, Grenoble, France, July 6-8, 2014.
17. **Invited**, “Printed Electronics: A pathway to functionally-rich systems”, 64th annual IEEE Electronic Components and Technology Conference, Orland, FL, May 27, 2014.
18. **Invited**, “Printed Electronics: The Confluence of Printing and Semiconductors”, Canadian Printed Electronics Symposium, Montreal, Canada, April 9, 2013.
19. **Invited** “Modeling, scaling, and integration of gravure printing for fast switching Organic FETs”, V. Subramanian, S. J. S. Morris, H. Kang, Materials Research Society Fall 2012 Meeting, Boston, MA, Nov 25-30, 2012

20. **Invited**, “Printed Nanoparticles as routes to high-performance printed conductors: Synthesis, Printing Processes, and Device Applications”, V. Subramanian, H. Kang, R. Kitsomboonloha, and S. K. Volkman, The 2012 International Conference on Flexible and Printed Electronics ICFPE2012, Tokyo, Japan, September 6th - 8th, 2012
21. **Invited** “Advanced Printing Processes for High-Performance Printed Transistors”, V. Subramanian, Flextech Workshop on Printing Electronics - Ink and Substrate Interactions, Kalamazoo, MI, August 1-2, 2012
22. **Invited** “High-performance Printed Transistors: Materials, Processes, and Devices”, V. Subramanian, 2nd CPEM International Symposium “Organic Semiconductors and Printed Electronics”, Gyeonggi, South Korea, May 10th, 2012.
23. **Invited** “Highly-Scaled Gravure and Inkjet Printed Organic Transistors: Tools, Processes, and Devices”, Hongki Kang & Vivek Subramanian, 2012 Flextech Flexible Electronics and Display Conference, Phoenix, AZ, Feb 5-9, 2012.
24. **Plenary** “Nanomaterials for printed electronics: synthesis, design, and applications”, V. Subramanian, International Conference on Nano Science and Nano Technology, Sunchon, Korea, November 11th, 2011.
25. **Invited** “Advances in scaling of printed transistors”, V. Subramanian, International Seminar on Printed Electronics, Seoul, Korea, June 8th, 2011.
26. **Invited** “High-Performance Fully Printed Transistors: Materials, Processes, and Device Characteristics”, V. Subramanian, H. Tseng, R. Kitsomboonloha, and A. de la Fuente Vornbrock, 2011 Electrochemical Society Meeting, Montreal, Canada, May 2011
27. **Invited** “From Droplets to Devices: Printed Transistor Processes, Integration, and Characteristics”, Vivek Subramanian, Daniel Soltman, Huai-Yuan Tseng, Rungrot Kitsomboonloha and Alejandro de la Fuente Vornbrock, Materials Research Society Spring Meeting, San Francisco, CA, April 2011
28. **Keynote** “Printed electronics: Innovations in tools, materials, devices, and applications”, V. Subramanian, 2011 Korea Printed Electronics Association (KoPeA) meeting, Seoul, Korea, March 2011
29. **Keynote** “Printed RF tags and sensors: the confluence of printing and semiconductors”, V. Subramanian, F. Liao, and H-Y. Tseng, The European Microwave Integrated Circuits Conference 2010, Paris, France, September 2010.
30. **Invited** “Droplet-on-demand direct patterning of active materials: materials, modeling, and integration”, V. Subramanian, The 2010 IEEE Lithography Workshop, Kuai, Hawaii, November 2010
31. **Plenary** “Printed electronics: where are we, and where are we going”, V. Subramanian, 2010 Large Area Organic, and Printed Electronics Convention (LOPE-C), Frankfurt, Germany, June 2010.
32. **Keynote** “Printed RFID: Technology Trends and Outlook”, V. Subramanian, IEEE International Conference on RFID 2010, Orlando, Florida, April 2010.
33. **Invited** “Mechanistic studies on sintering of nanoparticles for formation of solution-processed thin films”, 2010 Spring meeting of the Materials Research Society, San Francisco, CA, April 2010.
34. **Invited** “Printed Electronics: the confluence of printing and semiconductors”, Vivek Subramanian, 2009 International Conference on Flexible and Printing Electronics, Jeju Island, Korea, Nov 2009.
35. **Invited** “Organic Transistor Vapor and Biosensors – Technology Status and Implementation Issues”, Vivek Subramanian, Frank Liao, Lakshmi Jagannathan, Electrochemical Society Meeting, Vienna, Austria, October 2009.
36. **Invited** “Printed transistors for low-cost electronics: the confluence of printing and printable electronic materials”, Vivek Subramanian, Alejandro de la Fuente Vornbrock, Steven Molesa, Daniel Soltman, Huai-Yuan Tseng, and Steven K. Volkman, SPIE Optics + Photonics, August 2-6, 2009, San Diego, CA
37. **Invited** “Printed Zinc Oxide Based Electronics: Materials, Devices, and Outlook”, V. Subramanian, S. K. Volkman, and D. R. Redinger, LOPE-C, June 23-25, 2009, Frankfurt, Germany
38. **Invited** “Printed Devices for Low-Cost Electronics: Technology Status and Outlook”, V. Subramanian, PETEC Inaugural Event, March 17, 2009, Durham, United Kingdom
39. **invited** “Printed Electronic Tags and Sensors for Smart Packaging Applications”, Vivek Subramanian, Josephine Chang, Lakshmi Jagannathan, Frank Liao, Steve Molesa, David Redinger, Daniel Soltman, Huai-Yuan Tseng, Steve Volkman, Shong Yin, 2009 Flexible Electronics and Display Conference, Phoenix, AZ, Feb 2-5, 2009.
40. **invited** “Electronic Nose Sensors for Consumer Packaging”, V. Subramanian, IDTechEx Printed Electronics USA, San Jose, CA, Dec 2-5, 2008.

41. **invited** "Solution-Processed Transparent Transistors for Low-Cost, Flexible Displays", V. Subramanian, S. K. Volkman, and D. R. Redinger, LEOS 2008: The 21st Annual Meeting of the IEEE Lasers and Electro-Optics Society, Newport Beach, CA, 9-13 November, 2008.
42. **invited** "Organic chemical and biosensors for smart packages", V. Subramanian, IDTechEx Printed Electronics Asia, Tokyo, Japan, Oct 8-9, 2008.
43. **invited** "Printed Electronics for Low-Cost Tags, Displays, and Sensors", V. Subramanian, 1st International Conference on R2R Printed Electronics, Seoul, Korea, April 30-May 2, 2008.
44. **invited** "Printed organic RFID tags: technology, roadmaps, and challenges", V. Subramanian, 1st Plastic Electronics Asia Conference and Showcase, Seoul, Korea, June 24-26, 2008
45. **invited** "Power supply considerations and solutions for printed electronic tags and sensors", V. Subramanian, IDTechEx Printed Electronics Europe, Dresden, Germany, April 8-9, 2008
46. **invited** "Printed Chemical and Biosensors: Technology, Design and Challenges", GOSPEL Workshop on Plastic Chemical Sensors, Dresden, Germany, April 9, 2008
47. **Plenary** "Printed Electronics For Low-Cost Electronic Systems: Technology Status and Application Development", Vivek Subramanian, Josephine B. Chang, Alejandro de la Fuente Vornbrock, Daniel C. Huang, Lakshmi Jagannathan, Frank Liao, Brian Mattis, Steven Moles, David R. Redinger, Daniel Soltman, Steven K. Volkman, Qintao Zhang, 38th European Solid State Device Research Conference, Edinburgh, Scotland, September 15-19, 2008
48. **invited** "Printed Organic Transistors for Low-cost Tags, Displays, and Sensors: Technology, Modeling and Challenges", Vivek Subramanian, Alejandro de la Fuente Vornbrock, Huai-Yuan Tseng and Shong Yin, Materials Research Society Fall Meeting, Boston, MA, Dec 1-4, 2008.
49. **invited** "Printed Electronics for Low-Cost Tags and Sensors", Vivek Subramanian, Sixth Annual Workshop on Microelectronics and Electron Devices, April 18, 2008.
50. **invited** "Printed organic RF tags, chemical sensors and biosensors", Vivek Subramanian, International Symposium for Flexible Electronics and Display, Hsinchu, Taiwan, Nov 18, 2007.
51. **invited** "Printed Tags and Sensors for RFID: Opportunities and Challenges", Vivek Subramanian, Printed Electronics USA 2007, San Francisco, CA, Nov 14, 2007.
52. **invited** "Printed RFID Tags: Materials, Processes, and Devices", Vivek Subramanian, Daniel Soltman, Daniel Huang, Steven Moles, 2007 AiChE Annual Meeting, Salt Lake City, UT, Nov. 8, 2007.
53. **invited** "Printed organic RFID tags: technology, roadmaps, and challenges", Vivek Subramanian, 3rd Global Plastic Electronics Conference and Showcase, Frankfurt, Germany, Oct 30, 2007.
54. **invited** "Printed organic transistors: technology, characteristics, and modeling", Vivek Subramanian, Alejandro de la Fuente Vornbrock, Daniel Soltman, Huai-Yuan Tseng, and Steve Moles, 212th meeting of the Electrochemical Society, Washington, DC, Oct 8, 2007.
55. **invited** "Printed electronic tags and sensors - device, materials, and circuit issues", Vivek Subramanian, 2007 Organic Electronics Conference and Exhibition, Frankfurt, Germany, Sept 25, 2007.
56. **invited** "Inkjet printing of transistors, diodes, and passive components for smart tags", Vivek Subramanian, Innovations in Inkjet: 3rd DPI Inkjet Workshop, Eindhoven Institute of Technology, Netherlands, June 28-29, 2007.
57. **invited** "Printed organic transistors", A. de la Fuente and V. Subramanian, Industry Forum on Printed Electronics, Chicago, IL, April 23-24, 2007
58. **invited** "From Materials to Circuits: Implications of printed materials on printed RFID", V. Subramanian, 2007 Pira printed RFID conference, Frankfurt, Germany, June 4-6, 2007.
59. **keynote** "Droplet on demand lithography: An enabling technology for low-cost electronics", V. Subramanian, A. de la Fuente Vornbrock, S. Moles, D. Redinger, Q. Zhang, and S. K. Volkman, SPIE Advanced lithography, 27th February, 2007
60. **invited** "Printed RFID tags: performance needs and technology trends", V. Subramanian, 2007 IDTechEx Smart labels USA , Boston, MA, February 20-23, 2007.
61. **keynote** "Printed Organic Transistors for low-cost tagging and sensing applications", V. Subramanian, J. Chang, A. de la Fuente Vornbrock, S. Moles, D. Soltman, and Q. Zhang. 6th International IEEE Conference on Polymers and Adhesives in Microelectronics and Photonics, Tokyo, January 15th-18th, 2007.

62. *invited* “Nano Inks for Printed RFID”, V. Subramanian, Pira Nanoscale Inks and Pigment Technologies Conference, Chicago, IL, Sept 27-28, 2006.
63. *invited* “Toward Printed RFID: Materials, Processes, and Devices”, V. Subramanian, 5th Annual Printed Electronics and Displays Conference and Trade Fair, Las Vegas, Oct 11-13, 2006.
64. *invited* “Inkjetted Organic Transistors for Smart Tagging Applications”, Vivek Subramanian, Jean M. J. Frechet, Steven Molesa, Josephine Chang, Amanda R. Murphy, Alejandro de la Fuente Vornbrock, Steven Volkman, 2006 AiChE Annual Meeting, Nov 17th, 2006
65. *invited focal paper* “All-printed electronics: Materials, Devices, and Circuit Implications”, V. Subramanian, J. Chang, S. Molesa, D. Redinger, and S. Volkman, Digital Fabrication 2006, Denver, CO, Sept 17-22, 2006.
66. *invited* “Printed transistors and passive components for low-cost electronics applications”, V. Subramanian, J. B. Chang, S. E. Molesa, S. K. Volkman, and D. R. Redinger, International Symposium on VLSI Technology, Systems and Applications (VLSI-TSA) April, 2006, pp. 68-9.
67. *invited* “Advanced printed materials and devices for RFID applications”, V. Subramanian, IDTechEx Printed Electronics Europe, April 19-21, 2006.
68. *invited* “Printed Electronic Nose Vapor Sensors for Consumer Product Monitoring”, V. Subramanian, J. Lee, V. Liu, S. Molesa, IEEE International Solid State Circuits Conference, Paper 15.3, February, 2006.
69. *invited* “Nanotechnology in Printed Electronics: Nanoparticles, Nanorods, and Nanowhy”, V. Subramanian, Pira Pack Electronics Conference, January 25-26, 2006.
70. *invited* “All-printed RFID Tags: Materials, Devices, and Circuit Implications”, Vivek Subramanian, Paul C. Chang, Daniel Huang, Josephine B. Lee, Steven E. Molesa, David R. Redinger, and Steven K. Volkman, VLSI Design, 2006, Hyderabad India, Jan 2006.
71. *invited* “Printed organic transistors: materials and technology”, Vivek Subramanian, Pacificchem 2005: American Chemical Society Pacific Basin meeting, December 15-20, 2005, Honolulu, HI,
72. *invited* “Low-cost arrayed gas sensors for environmental monitoring”. Vivek Subramanian, Josephine Lee and Vincent Liu, Materials Research Society Fall Symposium, Paper S2.1, Boston, MA, December 2005.
73. *invited* “Prospects for All-printed RFID: Materials, Devices, Circuits”, V. Subramanian, International Workshop on Radio Frequency Identification (RFID) and Wireless Sensors, 11-13 November, 2005, Kanpur, India.
74. *invited* “Printed electronics for low-cost tagging applications”, V. Subramanian, 2005 International Symposium on Flexible Electronics and Display, Hsinchu, Taiwan, October 2005.
75. *invited* “Printed electronic nose gas sensors”, Vivek Subramanian, Plastic Electronics 2005, Frankfurt, Germany, Oct 4-5, 2005
76. *invited* “Uses of nanotechnology in printed electronics”, Vivek Subramanian, Printed Electronics 2005, Pira International, Thistle Marble Arch, London, UK, Sept 14-15, 2005
77. *invited* “Printed organic transistors for low-cost RFID applications”, Vivek Subramanian, Proceedings of SPIE-The International Society for Optical Engineering vol. 5940, (594013/1-594013/9) , pp. 170-178, 2005.
78. *invited* “Advanced printed materials and devices for ultra-low-cost RFID”, Vivek Subramanian, Printed RFID: Achieving low cost tags through printed electronics – Pira International, Gatwick, Surrey, UK, May 10-11, 2005.
79. *Plenary session invited talk* “Printed Organic Transistors for Ultra-low-cost RFID Applications”, Vivek Subramanian, Paul C. Chang, Josephine B. Lee, Steven E. Molesa, and Steven K. Volkman, Polytronic 2004: 4th International IEEE Conference on Polymers and Adhesives in Microelectronics and Photonics, Portland, Oregon, USA, 12 September 2004.
80. *invited* “Materials, Device, and Circuits Issues for low-cost printed RFID”, V. Subramanian, 2nd Cintelliq Organic Semiconductor Conference, 2004 (OSC-2004), Cambridge, England, October 2004.
81. *invited* “All-printed flexible organic thin film transistors: Current status and outlook for the future”, V. Subramanian, J. M. J. Fréchet, P. C. Chang, D. C. Huang, J. B. Lee, F. Liao, B. A. Matis, S. Molesa, A. R. Murphy, D. R. Redinger, and S. K. Volkman, 206th meeting of the Electrochemical Society, Honolulu, HI, October 2004.
82. *invited* “Nanoscale organic transistors: towards gain in molecular devices”, V. Subramanian, P. C. Chang, J. B. Lee, T. Le, A. Murphy, J. M. J. Frechet, and A. Liddle, 2004 IEEE Nanoscale Devices and Systems Integration Conference, Miami, FL, 2004.

83. **invited** “Towards Printed Low-Cost RFID Tags: Device, Materials and Circuit Technologies”, V. Subramanian, 2nd Advanced Technology Workshop on Printing an Intelligent Future: Printed Organic and Molecular Electronic Technologies, Boston, MA, March 16-19, 2003.
84. **invited** “Prospects for organic semiconductor based devices and circuits: applications, performance, and reliability considerations”, V. Subramanian, 2002 Topical Research Conference on Reliability, Oct 2002.
85. **invited** “FinFET - quasi-planar double-gate MOSFET”, S. H. Tang, L. Chang, N. Lindert, Y-K. Choi, W-C. Lee, X. Huang, V. Subramanian, J. Bokor, T-J. King, C. Hu, 20001 IEEE International Solid-State Circuits Conference Digest of Technical Papers, pp. 118-119, 437, 2001.
86. **invited** “3-D ICs with Multiple Si Layers: Performance Analysis, and Technology”, K. Saraswat, K. Banerjee, A. Joshi, P. Kalavade, S. Sour, and V. Subramanian, *presented at* The Fifth International Symposium on Low and High Dielectric Constant Materials: Materials Science, Processing, and Reliability Issues, 197th meeting of the Electrochemical Society, Toronto, Ontario, Canada, May 14-18, 2000.
87. **invited** “Novel 3-D Structures”, K. C. Saraswat, S. J. Sour, V. Subramanian, A. R. Joshi, and A. W. Wang, 1999 IEEE International SOI Conference Proceedings, pp. 54-55.
88. **invited** “Seeding Technology for High Performance TFTs”, K. C. Saraswat and V. Subramanian, Proceedings of the Electronic Display Forum 98, EIAJ/SEMI, Yokohama, April 1998, pp. 2.7-2.15.
89. **invited** “A Low-Temperature Polycrystalline Si TFT Technology for Large-Area AMLCD Drivers”, K. C. Saraswat, V. Subramanian, and S. Jurichich, Polycrystalline Thin Films III - Structure, Texture, Properties, and Applications, MRS Symposium Proceedings pp 439-449, 1997.
90. **invited** “A low temperature polycrystalline SiGe CMOS TFT technology for large area AMLCD drivers”, K. C. Saraswat, S. Jurichich, T.-J. King, V. Subramanian, and A. Wang, Proceedings of Thin Film Transistor Technologies III, ECS Symposium, 1996, pp. 186-196.

Journal Papers

1. **invited** Gerd Grau and Vivek Subramanian, “Dimensional scaling of high-speed printed organic transistors enabling high-frequency operation”, *Flex. Print. Electron.* 2020, Vol. 5 014013
2. **invited** William Scheideler and Vivek Subramanian, “Printed flexible and transparent electronics: enhancing low-temperature processed metal oxides with 0D and 1D nanomaterials”, *2019 Nanotechnology* 30 272001
3. R. Kumar, K. M. Johnson, N. X. Williams, V. Subramanian, “Scaling Printable Zn–Ag₂O Batteries for Integrated Electronics”, *Adv. Energy Mater.* 2019, 1803645.
4. William J. Scheideler, Matthew W. McPhail, Rajan Kumar, Jeremy Smith, and Vivek Subramanian, “Scalable, High-Performance Printed InOx Transistors Enabled by Ultraviolet-Annealed Printed High-k AlOx Gate Dielectrics”, *ACS Applied Materials & Interfaces* 2018 10 (43), 37277-37286.
5. J. Smith, S. Chung, J. Jang, C. Biao, V. Subramanian, “Solution-processed complementary resistive switching arrays for associative memory”, *IEEE Transactions on Electron Devices* 64 (10), pp 4310, 2017
6. A. Zeumault, V. Subramanian, “Use of high-k encapsulation to improve mobility in trap-limited metal oxide semiconductors”, *physica status solidi (b)* 254 (10), 1700124, 2017
7. A. Zeumault, W. Scheideler, V. Subramanian, “Electrostatic tuning of spray-deposited ZnO for controlled mobility enhancement”, *Advanced Functional materials*, 27 (30), pp. 1701021, 2017
8. W. J. Scheideler, R. Kumar, A. R. Zeumault, V. Subramanian, “Low-Temperature-Processed Printed Metal Oxide Transistors Based on Pure Aqueous Inks”, *Advanced Functional Materials* 2017, 1606062.
9. Jaewon Jang, Vivek Subramanian, “Effect of electrode material on resistive switching memory behavior of solution-processed resistive switches: Realization of robust multi-level cells”, *Thin Solid Films*, Volume 625, Pages 87-92, 1 March 2017.
10. S. Chung, M. A. U. Karim, H. J. Kwon, W. Scheideler and V. Subramanian, “A High-Speed Inkjet-Printed Microelectromechanical Relay With a Mechanically Enhanced Double-Clamped Channel-Beam,” *Journal of Microelectromechanical Systems*, vol. 26, no. 1, pp. 95-101, Feb. 2017.
11. G. Grau, E. J. Frazier, and V. Subramanian, “Printed unmanned aerial vehicles using paper-based electroactive polymer actuators and organic ion gel transistors”, *Nature Microsystems & Nanoengineering*, vol 2, pp. 16032, 2016

12. **invited** Gerd Grau, Jialiang Cen, Hongki Kang, Rungrot Kitsomboonloha, William J Scheideler, and Vivek Subramanian "Gravure-printed electronics: recent progress in tooling development, understanding of printing physics, and realization of printed devices", IOP Journal of Flexible and Printed Electronics, vol. 1, No. 2, pp. 023002, 2016
13. Scheideler, William J., Jeremy Smith, Igal Deckman, Seungjun Chung, Ana Claudia Arias, and Vivek Subramanian. "A robust, gravure-printed, silver nanowire/metal oxide hybrid electrode for high-throughput patterned transparent conductors." Journal of Materials Chemistry C 4, no. 15 (2016): 3248-3255.
14. Karim, Muhammed Ahosan Ul, Seungjun Chung, Elad Alon, and Vivek Subramanian. "Fully Inkjet-Printed Stress-Tolerant Microelectromechanical Reed Relays for Large-Area Electronics." Advanced Electronic Materials (2016).
15. Khan, Yasser, Felipe J. Pavinatto, Monica C. Lin, Amy Liao, Sarah L. Swisher, Kaylee Mann, Vivek Subramanian, Michel M. Mahabiz, and Ana C. Arias. "Bioelectronic Interfaces: Inkjet-Printed Flexible Gold Electrode Arrays for Bioelectronic Interfaces (Adv. Funct. Mater. 7/2016)." Advanced Functional Materials 26, no. 7 (2016): 981-981.
16. Jang, Jaewon, Seungjun Chung, Hongki Kang, and Vivek Subramanian. "P-type CuO and Cu₂O transistors derived from a Sol–Gel Copper (II) acetate monohydrate precursor." Thin Solid Films (2016).
17. Grau, Gerd, and Vivek Subramanian. "Fully High-Speed Gravure Printed, Low-Variability, High-Performance Organic Polymer Transistors with Sub-5 V Operation." Advanced Electronic Materials (2016).
18. Zeumault, Andre, and Vivek Subramanian. "Mobility Enhancement in Solution-Processed Transparent Conductive Oxide TFTs due to Electron Donation from Traps in High-k Gate Dielectrics." Advanced Functional Materials (2016).
19. Zeumault, Andre, William Scheideler, Gerd Grau, Jeremy Smith, and Vivek Subramanian. "Patterning of Solution-Processed, Indium-Free Oxide TFTs by Selective Spray Pyrolysis." Advanced Electronic Materials (2015).
20. Jang, Jaewon, Hongki Kang, Himamshu C. Nallan Chakravarthula, and Vivek Subramanian. "Fully Inkjet-Printed Transparent Oxide Thin Film Transistors Using a Fugitive Wettability Switch." Advanced Electronic Materials 1, no. 7 (2015).
21. Grau, Gerd, Rungrot Kitsomboonloha, Hongki Kang, and Vivek Subramanian. "High performance printed organic transistors using a novel scanned thermal annealing technology." Organic Electronics 20 (2015): 150-157.
22. Zeumault, Andre, and Vivek Subramanian. "Improved Technique for Quantifying the Bias-Dependent Mobility of Metal-Oxide Thin-Film Transistors." Electron Devices, IEEE Transactions on 62, no. 3 (2015): 855-861.
23. Swisher, Sarah L., Steven K. Volkman, and Vivek Subramanian. "Tailoring Indium Oxide Nanocrystal Synthesis Conditions for Air-Stable High-Performance Solution-Processed Thin-Film Transistors." ACS applied materials & interfaces 7, no. 19 (2015): 10069-10075.
24. Koo, Hyunmo, Wookyu Lee, Yunchang Choi, Junfeng Sun, Jina Bak, Jinsoo Noh, Vivek Subramanian, Yasuo Azuma, Yutaka Majima, and Gyoujin Cho. "Scalability of carbon-nanotube-based thin film transistors for flexible electronic devices manufactured using an all roll-to-roll gravure printing system." Scientific reports 5 (2015).
25. "Perpendicular Magnetization Switching via Current induced Spin-Orbit Torques on Flexible Substrate", O.J. Lee, L. You, J. Jang, V. Subramanian, S. Sahahuddin, Bulletin of the American Physical Society 60, 2015.
26. "High-Performance Inkjet-Printed Four-Terminal Microelectromechanical Relays and Inverters", Seungjun Chung, Muhammed Ahosan Ul Karim, Hyuk-Jun Kwon, and Vivek Subramanian, Nano Letters, 15 (5), pp 3261–3266, 2015.
27. **Invited** Subramanian, Vivek, Jialiang Cen, Alejandro de la Fuente Vornbrock, Gerd Grau, Hongki Kang, Rungrot Kitsomboonloha, Daniel Soltman, and Huai-Yuan Tseng. "High-Speed Printing of Transistors: From Inks to Devices." Proceedings of the IEEE 103, no. 4 (2015): 567-582.
28. Scheideler, William J., Jaewon Jang, Muhammed Ahosan Ul Karim, Rungrot Kitsomboonloha, Andre Zeumault, and Vivek Subramanian. "Gravure-Printed Sol–Gels on Flexible Glass: A Scalable Route to Additively Patterned Transparent Conductors." ACS applied materials & interfaces 7, no. 23 (2015): 12679-12687.
29. Lee, OukJae, Long You, Jaewon Jang, Vivek Subramanian, and Sayeef Salahuddin. "Flexible spin-orbit torque devices." Applied Physics Letters 107, no. 25 (2015): 252401.
30. Kitsomboonloha, Rungrot, Hongki Kang, Gerd Grau, William Scheideler, and Vivek Subramanian. "MHz-Range Fully Printed High-Performance Thin-Film Transistors by Using High-Resolution Gravure-Printed Lines." Advanced Electronic Materials 1, no. 12 (2015).
31. Swisher, Sarah L., Monica C. Lin, Amy Liao, Elisabeth J. LeeFlang, Yasser Khan, Felipe J. Pavinatto, Kaylee Mann et al. "Impedance sensing device enables early detection of pressure ulcers in vivo." Nature communications 6 (2015).

32. "A Stencil Printed, High Energy Density Silver Oxide Battery Using a Novel Photopolymerizable Poly(acrylic acid) Separator", K. Braam and V. Subramanian, *Advanced Materials*, Vol. 27, 689-694, 2015
33. "Megahertz-class printed high mobility organic thin-film transistors and inverters on plastic using attoliter-scale high-speed gravure-printed sub-5 μ m gate electrodes", H. Kang, R. Kitsomboonloha, K. Ulmer, L. Stecker, G. Grau, J. Jang, V. Subramanian, *Organic Electronics*, vol. 15, 3639-3647, 2014.
34. "Exploitation of the coffee-ring effect to realize mechanically enhanced inkjet-printed microelectromechanical relays with U-bar-shaped cantilevers", S Chung, MAU Karim, M Spencer, HJ Kwon, CP Grigoropoulos, E Alon, V. Subramanian, *Applied Physics Letters* 105 (26), 261901, 2014.
35. "Printed Transistors on Paper: Towards Smart Consumer Product Packaging", G. Grau, R. Kitsomboonloha, S. L. Swisher, H. Kang, and V. Subramanian, *Advanced Functional Materials*, Vol. 24, 5067-5074, 2014.
36. "Cell Filling in Gravure Printing for Printed Electronics, J. Cen, R. Kitsomboonloha, and V. Subramanian, vol. 30, 13716-13726, 2014.
37. "Systematic Design of Jettable Nanoparticle-based inkjet inks: Rheology, Acoustics, and Jettability", H. C. Nallan, J. A. Sadie, R. Kitsomboonloha, S. K. Volkman, and V. Subramanian, *Langmuir*, vol. 30, 13470-13477, 2014.
38. "Three-dimensional Inkjet-printed Interconnects using Functional Metallic Nanoparticle Inks", J. A. Sadie, V. Subramanian, *Advanced Functional Materials*, vol. 24, 6834-6842, 2014.
39. "Electrical Characteristics of multilayer MoS₂ transistors at real operating temperatures with different ambient conditions", H-J. Kwon, J. Jang, S. Kim, V. Subramanian, and C. P. Grigoropoulos, *Applied Physics Letters*, vol. 105, 15205, 2014.
40. "Lubrication-related residue as a fundamental process scaling limit to gravure printed electronics", R. Kitsomboonloha and V. Subramanian, *Langmuir*, vol. 30, 3612-3624, 2014.
41. "Roll-to-roll gravure with nanomaterials for printing smart packaging", M. Jung, J. Kim, H. Koo, W. Lee, V. Subramanian, G. Cho, *Journal of Nanoscience and Nanotechnology*, vol. 14, 1303-1317, 2014.
42. "Measurement and analysis of 1/f noise under switched bias in organic thin film transistors", H. Kang and V. Subramanian, *Applied Physics Letters*, 104, 023301, 2014.
43. "A new switching device for printed electronics: Inkjet-printed Microelectromechanical Relay", E. S. Park, Y. Chen, T. J. K. Liu, and V. Subramanian, *Nano Letters*, 13 (11), 5355-5360, 2013.
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64. **Invited** “Printed Electronics: The Challenges Involved in Printing Devices, Interconnects, and Contacts”, J. Perelaer, P. J. Smith, D. Mager, D. Soltman, S. K. Volkman, V. Subramanian, J. G. Korvink, U. S. Schubert, *J. Mat. Chem., J. Mater. Chem.*, 20, pp. 8446-8453, 2010
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2. Carlos Biao, Matt McPhail, Vivek Subramanian and Oscar Dubon, "Comprehensive Multifactorial Studies on the Degradation of Perovskite Solar Cells in Operation", *2019 Spring Materials Research Society Meeting*, Phoenix, AZ, April 22-26, 2019.

3. Rajan Kumar, Jessica E. Nichols, Bryan D. McCloskey, and Vivek Subramanian, "Low-Temperature-Processing of Printed Cathodes for Aqueous Metal-Air Batteries", ECS AiMES 2018 Meeting, September 30, 2018 - October 4, 2018, Cancun, Mexico
4. N. Deka and V. Subramanian, "First demonstration of vacuum-sealed fully integrated BEOL-compatible field emission devices for Si integrated high voltage applications," 2018 76th Device Research Conference (DRC), Santa Barbara, CA, 2018, pp. 1-2.
5. "Inkjet-printed MEM relays for active solar cell routing", S Patel, WJ Scheideler, MAU Karim, V Subramanian, Micro Electro Mechanical Systems (MEMS), 2018 IEEE, 616-619
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8. "Improving high-speed nanomaterial printing with sub-process-decoupled gravure printer design", W. Scheideler, V. Subramanian, ASME 2017 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems, Snowbird, UT, Sept 18-20, 2017
9. "Development of a printed cathode and catalyst layer for printed zinc-air batteries, R. Kumar, N. Williams, and V. Subramanian, 232nd ECS Meeting, National Harbor, MD, Oct 1-5, 2017.
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38. "Experimental study of the residue film in direct gravure printing of electronics", Rungrot Kitsomboonloha, Umut Ceyhan, SJS Morris, Vivek Subramanian, 65th Annual Meeting of the APS Division of Fluid Dynamics, Volume 57, Number 17, San Diego, California, November 18-20, 2012
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