

**SPECIAL ISSUE**

**FLEXIBLE ELECTRONIC SKIN: FROM HUMANOIDS TO HUMANS**

*Edited by R. Dahiya, D. Akinwande, and J. Chang*

**2016 Large-Area Soft e-Skin: The Challenges Beyond Sensor Designs**

*By R. Dahiya, N. Yogeswaran, F. Liu, L. Manjakkal, E. Burdet, V. Hayward, and H. Jörntell*

**| INVITED PAPER |** This article presents the state of the field of large-area tactile sensing in robotics and prosthetics, particularly focusing on neural-like tactile data handling, energy autonomy, and advanced manufacturing based on printed electronics.

**2034 A Comprehensive Realization of Robot Skin: Sensors, Sensing, Control, and Applications**

*By G. Cheng, E. Dean-Leon, F. Bergner, J. R. Guadarrama Olvera, Q. Leboutet, and P. Mittendorf*

**| INVITED PAPER |** This article presents a holistic approach to engineer the artificial skin for robots with an example of a multimodal skin cell showing multiple humanlike sensing modalities.

**2052 E-Skins: Biomimetic Sensing and Encoding for Upper Limb Prostheses**

*By M. M. Iskarous and N. V. Thakor*

**| INVITED PAPER |** This article focuses on prosthetic application of e-skin, discussing the physiology of the receptors that encode tactile, thermal, nociceptive, and proprioceptive information and the sensors designed to mimic them.

**2065 Flexible Multimodal Sensors for Electronic Skin: Principle, Materials, Device, Array Architecture, and Data Acquisition Method**

*By S. Jeon, S.-C. Lim, T. Q. Trung, M. Jung, and N.-E. Lee*

**| INVITED PAPER |** This article presents the research trends and approaches in the field of flexible and stretchable multimodal sensors for e-skin.

**2084 Flexible Ultralow-Power Sensor Interfaces for E-Skin**

*By C. Jiang, X. Cheng, and A. Nathan*

**| INVITED PAPER |** This article presents the state of the art in thin film electronics with examples of low-power transistors and sensor interfaces.

**2106 A Fully Additive Low-Temperature All-Air Low-Variation Printed/Flexible Electronics With Self-Compensation for Bending: Codesign From Materials, Design, Fabrication, and Applications**

*By J. S. Chang and T. Ge*

**| INVITED PAPER |** This article presents the codesign between the different chains of flexible electronics supply chain to derive practical flexible electronics and sensors for applications where the substrate is expected to bend.

**DEPARTMENTS**

**2011 SCANNING THE ISSUE**

Flexible Electronic Skin: From Humanoids to Humans

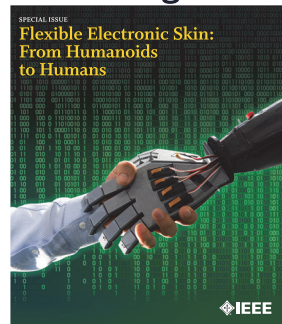
*By R. Dahiya, D. Akinwande, and J. S. Chang*

**2198 CORRECTIONS**

Corrections to “Jim Brittain and the Allure of Electrical History”

*By A. B. Magoun*

**2199 FUTURE SPECIAL ISSUE/SPECIAL SECTIONS**



**On the Cover:**

Our cover image this month captures one application of flexible e-skin, which promises to be transformative for several application areas in the near and far future.

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## SPECIAL ISSUE: Flexible Electronic Skin: From Humanoids to Humans

### 2118 Energy Scavenging and Powering E-Skin Functional Devices

By R. D. I. G. Dharmasena, K. D. G. I. Jayawardena, Z. Saadi, X. Yao,  
R. M. I. Bandara, Y. Zhao, and S. R. P. Silva

| INVITED PAPER | This article highlights the importance of scavenging energy from human body movements and presents some of the key developments that enable energy harvesting through mechanical and thermal affects, as well as energy management and storage technologies.

### 2137 Organic Photovoltaics: Toward Self-Powered Wearable Electronics

By K. Yu, S. Rich, S. Lee, K. Fukuda, T. Yokota, and T. Someya

| INVITED PAPER | This article discusses recent developments in flexible organic photovoltaics (OPVs), including advances in materials, structure, and integration with additional wearable components, such as sensors and displays.

### 2155 Physical and Chemical Sensing With Electronic Skin

By K. Takei, W. Gao, C. Wang, and A. Javey

| INVITED PAPER | This article discusses current progress on flexible and stretchable transistors and sensors for e-skin such as flexible chemical sensors for sweat analysis as well as physical sensors for detecting force, and temperature.

### 2168 Electronic Skins Based on Liquid Metals

By J. Yang, W. Cheng, and K. Kalantar-Zadeh

| INVITED PAPER | This article discusses liquid metal alloys of gallium which provide unique physical and chemical properties for e-skin, originating from their high thermal and electrical conductivities.

### 2185 Materials and Design Strategies of Stretchable Electrodes for Electronic Skin and Its Applications

By S. Hong, S. Lee, and D.-H. Kim

| INVITED PAPER | This article presents an overview of state-of-the-art technological advances in materials and design strategies for the development of stretchable electrodes.

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