

SEMINAR

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Energy Harvesting From Body Motion to Power Wearable Technology

by

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Abstract: Consumer electronics is progressively reducing its power consumption to provide maximum battery life to users. One of the most optimized electronic gadgets are wearables, in the form of fitness trackers, which offer high portability and ultra-low power features for its limited functionalities. These devices are at the convergence of high power efficiency and high mechanical activity from the user's training activity, energy that is usually not transformed and collected, and consequently is never used by the wearable device.

In this seminar, a project that harness mechanical energy from body motion through an efficient energy harvesting system is discussed. This end to end application considers the design of a custom transducer, a highly efficient and flexible rectification phase and a DC-DC conversion stage. This device is not only capable to extend the wearable's battery life but potentially be the base of a new generation of user-friendly battery less devices.

Alfredo Costilla-Reyes received the B.Sc. degree in electrical engineering from the Autonomous University of the State of Mexico, Toluca Mexico, in 2010. He is currently a PhD candidate in electrical engineering at the Analog & Mixed Signal Center (AMSC), Texas A&M University, College Station, TX, USA.

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His research interests include low power analog and mixed signal circuits, ultra-low power and energy efficient power management circuits for Energy Harvesting Applications and urban farming.

Amr Abuellil received the B.Sc. and M.Sc. degrees in electronics and communications from Ain-Shams University, Cairo, Egypt, in 2011 and 2016, respectively. Currently a Ph.D. student in electrical engineering at Texas A&M University, College Station, TX, USA. He previously worked in the analog design team of Silicon Vision LLC, Egypt (Currently a part of Synopsys Mixed Signal IP Department). He was involved with the design of power management and oscillator circuits for Bluetooth RF transceivers.

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