Research title: **Analysis and Design of Differentiator-Based Three-Input Single-Output Current Mode Universal Filter with Independent Electronically Tuned Quality Factor Capability**

Researcher: **Dr.Montri Somdunyakanok**

ABSTRACT

This paper presents the current mode universal filters based on lossless differentiator, synthesized from multi-output OTAs, including with grounded capacitors. The proposed universal filter consists of three-inputs and a single-output which can be realized as five different filtering transfer functions (LPF, HPF, BPF, BRF and APF) within the same circuit. Its quality factor (Q_P) can be electronically adjusted independent of its frequency response (ω_P) and, its sensitivity is quite low. The characteristics of the proposed circuit are simulated based on the PSpice program simulator and all results agree well with the theoretical results.

Keywords: Universal Filter / Differentiator / Quality factor