# 2020 IDEC Congress

## Chip Design Contest

Chair : Kyung-Rok Cho
(Chungbuk National University)
Date : 9 July, 2020
온라인 전시 (congress.idec.or.kr)

**IDEC**
반도체설계교육센터

주 최   산업통상자원부   **KIƌT** 한국산업기술진흥원

주 관   **IDEC** 반도체설계교육센터
IC DESIGN EDUCATION CENTER   **KAIST**

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| 논문번호 | 논문명 | 저자명 | 소속 |
|---|---|---|---|
| 202003003 | DT-CNN Dilated and Transposed Convolution Neural Network Accelerator for Real-time Image Segmentation on Mobile Devices | Dongseok Im, Donghyeon Han, Sungpill Choi, Sanghoon Kang, Hoi Jun Yoo | KAIST |
| 202003004 | A PVT-robust Customized 4T Embedded DRAM Cell Array for Accelerating Binary Neural Networks | Hyein Shin, Jaehyeong Sim, Daewoong Lee | KAIST |
| 202003005 | Wideband Receiver Front-end Employing Mismatch-Enhanced Quadrature Mixer | Beomsoo Bae | Chungnam National University |
| 202003006 | An Energy-Efficient Multi-DNN Training Processor for GANs with Speculative Dual-Sparsity Exploitation | Sanghoon Kang, Donghyeon Han, Juhyoung Lee, Dongseok Im, Sangyeob Kim, Soyeon Kim, Junha Ryu | KAIST |
| 202003007 | A field effect photo sensor suitable for a proximity optical communication scheme | Wei Chao | Kyung Hee University |
| 202003008 | A Low-Power CNN-Based Face Recognition Processor with Face Alignment for Mobile User Identification | Sanghoon Kang, Jinmook Lee, Changhyeon Kim | KAIST |
| 202003009 | Input Data Reordering Method Using Null Signal for Low Latency IFFT | Seo Hyeong Jeong, Jewook Kim | Jeonbuk National University |
| 202003010 | Implementation of 16APSK Baseband Modem | Soo Ill Park, Jun Ho Park | Jeonbuk National University |
| 202003011 | A 50.7dB-DR Finger-Resistance Extractable Multi-Touch Sensor IC Achieving Finger-Classification Accuracy of 97.7% on 6.7-inch Capacitive Touch Screen Panel | TaeGyun Song, Heejun Lee | KAIST |
| 202003012 | A CMOS Power Amplifier for 5G application | Seungwon Park | Korea university |
| 202003013 | A Multi-Channel Neural Recording Front-End System with Adaptive Electrode Selection | Han Sol Lee | Korea University |
| 202003014 | Partially Parallel Encoder Architecture for Polar Codes based on Bit-dimension Permutations | Soyeon Choi, Hyeonkyu Kim | Chungnam National University |

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|---|---|---|---|
| 202003015 | N형 폴리 저항 기반의 시간영역 CMOS 온도센서 | Zhiwei Xu | Dongguk University |
| 202003016 | An ultra-low-power CMOS RF front-end for MICS | Jeon Yangji, Myeong Jinman, Park Geonwoo, Lee Suyeon, Nam Ilku | Pusan National University |
| 202003017 | Design of Q-band Transmitter using 65nm CMOS Technology | Hyunkyu Lee | Korea university |
| 202003018 | 65-nm CMOS 공정을 이용한 mm-Wave Vector-sum 위상변화기 | Eunjung Kim | Korea university |
| 202003019 | Design of Q-band gilbert cell down conversion mixer using 65nm CMOS technology | Hyunkyu Lee, Seungwon Park | Korea university |
| 202003020 | A Boost OLED Driver with aging compensation for light therapy platform | Donghee CHO | KAIST |
| 202003021 | Automatic Mode Change Buck-Boost Converter for LED Driver | Yong in Park | Kangwon National University |
| 202003022 | A W-band Divide-by-Three Injection Locked Frequency Divider with Injection Current Boosting Utilizing Inductive Feedback in 65nm CMOS | Hyohyun Nam | Dongguk University |
| 202003024 | Fractional-N MDLL With TDC & LUT based SSPD | Dong Hyeok Cho | Kangwon National Univ |
| 202003025 | FINE-GRAINED POWER DELIVERY AND MANAGEMENT WITH ALL DIGITAL CAPACITOR-LESS LOW-DROPOUT REGULATORS | Muhammad Abrar Akram, Kyoung Tae Min, Jin Woong Jang | Kangwon National Univ |
| 202003026 | Heterogeneous Multi-Source Energy Harvesting Interface IC | TaeGyun Song, ChanHyu Jeon, SeUn Shin | Dankook University | KAIST |
| 202003027 | A 6-bit Phase Shifter in 65nm CMOS Technology | Tan Binh Ngo, Ju Hwan Lim, Wan Su Kim, Tae Hwan Park, Hye Jin Choi | KyungHee University |

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|---|---|---|---|
| 202003028 | High Performance Mixer Using Feedback Current reusing technique | Sung Hyun Pang, ChangWoo Lim, Tae Yeoul Yun | Hanyang University |
| 202003029 | A 12b 50MS/s 0.18μm CMOS SAR ADC Based on Highly Linear C-R Hybrid DAC | Je Min Jeon, Yong Tae Kim, Jun Sang Park | Sogang University |
| 202003031 | Design for Programmable Slew-rate Controlled Output Stages for Reducing EMI in DC-DC Converter | GiWon Kim, Hoang Nguyen van, TaeWoong Kim | SungKyun Kwan University |
| 202003032 | Noise Characteristics of the Charge Sharing Inverter-Based Switched-Capacitor Amplifier | Kiwon Seo | Yonsei University |
| 202003033 | Fully digital and Adaptive External Delay Control Circuit for MV – HEVC | Sangun Park, Wei Liu, Soon Yong Kwon | Konkuk University |
| 202003034 | MV – HEVC Chip Design using Memory & Delay Control Circuit | Sangun Park, Wei Liu, Soon Yong Kwon | Konkuk University |
| 202003035 | 1-2MASH based on Pipelined Noise Shaping SAR ADC | Juyong Lee | Konkuk University |
| 202003036 | Low-power Low-jitter Clock Distribution Network for LPDDR5 | Seongseop Lee | KAIST |
| 202003037 | A low power voltage step-up system for NAND flash | HyunSik Jeong | KAIST |
| 202003038 | Conditional-Reset Technique with P-diode Active Pixel Sensor for Variable Sensitivity of CMOS Image Sensor | SangHwan Kim, JangKyoo Shin | Kyungpook National University |
| 202003039 | A Wide-Dynamic-Range CMOS Image Sensor based on sensitivity-variable-type using Dual photodiode | Jimin Lee, JangKyoo Shin | Kyungpook National University |
| 202003040 | Wide Dynamic Range of CMOS Image Sensor Based on Active Pixel Sensor | SangHwan Kim, JangKyoo Shin | Kyungpook National University |
| 202003041 | CMOS Image Sensors Based on Variable Frame Rate | SangHwan Kim, JangKyoo Shin | Kyungpook National University |

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|---|---|---|---|
| 202003042 | 100-pair multi electrode array with 1K resolution controllable on-chip heater and temperature sensor | Hyeonsik Kim | Konkuk university |
| 202003043 | Design of 24GHz Frequency Synthesizer | Abrar Siddique, Myeong U Seong | Pukyong National University |
| 202003044 | Design of a DC–DC Converter Customized for Ultra-Low Voltage Operating IoT Platforms | MyeongGyu Yang, DongKyu Jung, BoKyoung Choi | ChungAng University |
| 202003045 | Computation in DRAM circuit | Hyunsun Mo, Khoa Van Pham, Daejeong Kim | Kookmin University |
| 202003046 | Thermal Effect Reduction Layout Technique for Nano-Scale CMOS Technologies | Minhyun Jin, Minkyu Song, Soo Youn Kim | Dongguk university |
| 202003047 | Low Noise Chopper Stabilized Non-Inverting Amplifier Using Dummy Mos | Chang Yun Kim | Chonbuk National University |
| 202003048 | A Reconfigurable Active-RC Complex Image Rejection Filter for Multimode Receiver Applications | Yu Min Jeong | Chonbuk National University |
| 202003049 | A Monolithic Digital Sun sensor with Integrated Window layer and Light-to-Digital Convertor | In Ho Song | Ajou Univ |
| 202003050 | A Low-Power CMOS Monolithic Sun Sensor with Integrated Window Layer and Light-to-Digital Convertor | In Ho Song | Ajou Univ |
| 202003051 | A 28V Modular Supply Multiplyhing Pulser With 60.6% Power Reduction Relative to CV2f | Kyu Jin Choi | Ajou Univ |
| 202003052 | A 28.7V Modular Supply Multiplying Pulser With 75.4% Power Reduction Relative to CV2f | Kyu Jin Choi | Ajou Univ |
| 202003053 | Single-wire, Bi-Directional, Simultaneous Interface for Sensor System With PPG Sensor | Jeong Kyun Kim | Ajou Univ |
| 202003054 | A Single-wire, Bi-Directional and Simultaneous Interface Architecture for Sensor System | Jeong Kyun Kim | Ajou Univ |

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| 202003055 | Single-wire, Bi-Directional, Simultaneous and Multi-access Interface Architecture for Sensor System | Jeong Kyun Kim | Ajou Univ |
| 202003056 | Single-wire, Bi-Directional, Simultaneous, Skew-compensated and Multi-access Interface Architecture for Sensor System | Jeong Kyun Kim | Ajou Univ |
| 202003057 | Low-Complexity Memory-Based Bit Flipping LDPC Decoding Architecture | Jaehwan Jung | KAIST |
| 202003058 | Charge Sensitive Amplifier for Pulse Signal Processing in Gamma-Ray Detection | SuJin Jeon, JaeSang Lee, SeokHo Hong, YongJin Kim, YoungWan Choi | Chung Ang University |
| 202003059 | DVS design in standard CMOS process | Seo Donghwan, Byung Geun Lee | GIST |
| 202003060 | Image sensor design with incremental ADC in standard CMOS process | Seo Donghwan, Byung Geun Lee | GIST |
| 202003061 | Design of RF Band Design of Quadruple-Mode Active Rectifier for Wireless Charging System of IoT/Wearable Devices | Sang Rim Back, Sang Gyu Jeon, Tae Young Yoon, Jae Bin Kim | Sungkyun kwan University |
| 202003062 | A Study on Low Power Transceiver for Bluetooth Low Energy 4.2/5.0 Dual Mode Applications | MinHyuk Lee, Sang Gyu Jeon, Tae Young Yoon, Jae Bin Kim | Sungkyun kwan University |
| 202003063 | 높은 이득과 선형성을 갖는 28 GHz 하향 주파수 혼합기 | Jin Seop Lee, Jae Kwon Ha, Yu Min Kim | Korea Aerospace University |
| 202003064 | A +3dBm-EIRP 240-GHz Circular-Polarized Radiator Utilizing a Sub-THz PA in 65-nm CMOS | Van Son Trinh | Dongguk University |
| 202003065 | A 16.3 dBm 14.1 % PAE 28-dB Gain W-band Push-Pull Power Amplifier Utilizing Inductive Feedback in 65-nm CMOS | Van Son Trinh | Dongguk University |
| 202003066 | Low-Noise Resistive Sensor Interface Circuit with Chopper-Stabilized Multi-Path Current-Feedback Instrumentation Amplifier | Donggeun You, Hyungseup Kim, Hyunwoo Heo, Yongsu Kwon | Chungnam National University |

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| --- | --- | --- | --- |
| 202003067 | Temperature Sensor Analog Front-End with Low-Noise Chopper-Stabilized Delta-Sigma Converter | Hyunwoo Heo, Hyungseup Kim, Donggeun You, Yongsu Kwon | Chungnam National University |
| 202003068 | Low Noise Chopper Multipath Amplifier with 129 dB Ripple Rejection using Floating High-Pass Filter and DC Servo Loop | Yongsu Kwon, Hyungseup Kim, Donggeun You, Hyunwoo Heo | Chungnam National University |
| 202003069 | Low-Power Freeze-Safe IoT-Driven Processor based on RISC-V using Large-Scaled Heterogeneous Co-Simulation Method | Hyeongyun Moon, Jeonghun Cho, Daejin Park | Kyungpook National University |
| 202003070 | A 0.5V-VIN, 0.29ps-Transient-FOM, and Sub-2mV-Accuracy Adaptive-Sampling Digital LDO Using Single-VCO-Based Edge-Racing Time Quantizer | Jeonghyun Lee, Jooeun Bang, Younghyun Lim\|UNIST, Seyeon Yoo | KAIST |
| 202003072 | A Design of Digital Feedback LDO Regulator with Fast Settling Time and Ultra-Low Dropout Voltage | Tae Wan Kim, Sang Gyu Jeon, Tae Young Yoon, Jong Wan Jo | Sungkyunkwan University |
| 202003073 | A Design of High Efficiency IC for Wireless Power Transfer System Application | Tae Wan Kim, Jong Wan Jo, Sang Gyu Jeon, Tae Young Yoon | Sungkyunkwan University |
| 202003074 | A -240dB-FOM and -115dBc/Hz-100kHz-PN, 7.7GHz-Ring-DCO Based Digital PLL Using P/I-Gain Co-Optimization | Yongsun Lee, Taeho Seong\|UNIST, Jeonghyun Lee, Chanwoong Hwang, Hangi Park | KAIST |
| 202003075 | Time Based MPPT Algorithm for Photovoltaic Cells in 018µm BCD Process | VanThai Dang, MyeongKyu Yang, KwangHyun Baek | ChungAng University |
| 202003076 | 차량용 HD급 Depth 추출 ASIC | Kyeong Kuk Min, Byungin Moon | Kyungpook National University |
| 202003077 | Design of DVS with CGPR structure in Standard CMOS 65nm Process | Jung Gyun Kim, Byung Geun Lee | GIST |
| 202003078 | A Zero-Crossing-Based Delta-Sigma Modulator using Ring-Amplifiers | Dong Jick Min, Soo Hwan Kim | Kyungpook National University |

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|---|---|---|---|
| 202003079 | A 680 nW, 1.8 µVrms, 1.8 GΩ Input Impedance Biomedical Amplifier for Neural Acquisition | Xuan Thanh Pham, Jong Wook Lee | Kyung Hee University |
| 202003080 | Noise Shaping SAR ADC with Charge Pump and Passive Signal-Residue Summation | Ngoc Tan Nguyen, Jong wook Lee | Kyung Hee University |
| 202003081 | Multi-Core Class-C Voltage Controlled Oscillator Design | SangHoon Kim, Jahoon Jin, JiHoon Park, Canxing Piao | Sungkyun kwan University |
| 202003082 | Area Efficient Neuromorphic Circuit Based on Stochastic Computation | Kiwon Yoon, Youngsoo Shin | KAIST |
| 202003083 | Components for a Sub-Terahertz Detection in 65-nm CMOS | Juhye SHIN, Seung Han HAN\|Hyundai Robotics | SeoulTech |
| 202003084 | Development of Offset Cancellation Scheme Based on Switched Capacitor for CMOS Hall Sensors | Se mi Lim, Kyu Hyun Nam | Kookmin University |
| 202003085 | Memory Cloudification Platform Using Remote Execution Code for Complex IoT Environment | Dongkyu Lee, Daejin Park | Kyungpook National University |
| 202003086 | A Micro-Sensor and Controller Chip with 4 Programmable Source and Measurement Units and a 10b Serial Output ADC for Wearable Health Monitoring Applications | Seongwook Choi, Jinhong Ahn | Seoul National University |
| 202003087 | 2-Channel DC-DC Converter with Dead Time Controller for Wearable AMOLED Displays | TaeUn Kim, JinHui Lee, SeungKi Jeon | Chungbuk National University |
| 202003088 | 12bit 10MS/s PIPELINED ADC | HoYong Jung | Kumoh National Institute of Technology |
| 202003089 | Sparsity-Aware CNN Accelerator for Noise-Resilient Edge-Level Image Recognition | Seungsik Moon, Hyunhoon Lee, Younghoon Byun, Jongmin Park, Junseo Joe, Seokha Hwang \| Samsung Electronics, Sunggu Lee, Youngjoo Lee | POSTECH |

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|---|---|---|---|
| 202003090 | A Boost OLED Driver with OLED current estimator by using the SenseFET | Donghee CHO | KAIST |
| 202003091 | A Reconfigurable SRAM-based Challenge-Response Generating PUF in 65nm CMOS | Seungbum Baek, Ju Hyeok Ahn | Chungbuk National University |
| 202003092 | Public-key Cryptography Processor Supporting RSA and ECC | ByungYoon Sung, SangHyun Lee, KyungWook Shin | Kumoh National Institute of Technology |
| 202003093 | Implementation of HMAC PHOTON Lightweight Cryptography with Low Power Consumption and Area Optimization | Kang Un Choi, Duc Nhan Le | Chungbuk National University |
| 202003094 | Low-Power, Linearity-Enhanced Low Noise Amplifier Using Wideband Resistive Feedback | GyeongSeok Lee, ChangWoo Lim | Hanyang university |
| 202003095 | STV 영역에서 작동하는 IoT EISC 프로세서의 성능향상 | SangHyun Park, Byungjin Hwang, Chang Hyun Kim | Korea university |
| 202003096 | Design of 24GHz Frequency Synthesizer | Abrar Siddique | Pukyong National University |
| 202003097 | Low Power SoC with Digital Filter Accelerator for Embedded System | Gwan Beom Hwang, Young Hyun Yoon, Chang Yeop Han, Do Young Choi, Hyun Woo Oh | Seoul National University of Science and Technology |
| 202003098 | A Low Power AI Processor for face expression recognition based on k-NN and RBF | Young Hyun Yoon, Su Yeon Jang, Chang Yeop Han, Gwan Beom Hwang, Kwon Neung Cho | Seoul National University of Science and Technology |
| 202003099 | Dynamic Power Reduction of TCAM Using Selective Precharging of Match Lines | Kim Sungyong, Hong Seungkwang | Sungkyun kwan University |

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| 202003100 | CMOS Microwave Bandpass Filter Using High Q Active Inductor | Qi Wang | Jeonbuk National University |
| 202003101 | 12-bit 3.072 GS/s 32-Way Time-Interleaved Pipelined ADC with Digital Background Calibration for Wideband Receiver in 65-nm CMOS | Waleed Hussain Siddiqui | Chosun University |
| 202003102 | 403.5-MHz CMOS Ring Oscillator for the Implementation in Biomedical Implantable Device in 180-nm CMOS | Arifa Ferdousi | Chosun University |
| 202003103 | Single-input 4-bit flash ADC with performance enhancement in 0.18 um CMOS | Yeon ho Seo | Chonbuk National University |
| 202003104 | An Area and Energy efficient Level Shifter for wide voltage and frequency ranges | Kiryong Kim, Ji Young Kim | Yonsei university |
| 202003105 | TCAM-PUF with Enhanced Reliability for Hardware Security | Nagakarthik, Yellappa Palagani, Jun Rim Choi | Kyungpook National University |
| 202003106 | Application of Current Mode Signal Processing: ADC | So Youn Park, Hyung Min Kim, Daniel Juhun Lee | Seoul National University of Science and Technology |
| 202003107 | PQC(Post Quantum Cryptography) 암호 시스템 구현 | Beom Joon Park, Won Bae Kong, Juyoun Baek | Hanyang University |
| 202003108 | 우수한 면적 효율을 갖는 고 분해능의 시간차 측정이 가능한 Vernier delay line의 설계 | Kiseok Lee, Geunyong Bak, Sanghyeon Baeg | Hanyang University |
| 202003109 | Radiation-hardened-by-design (RHBD) Pre-amplifier design for Radiation Harsh Environment | waseem muhammad, Byeongjae Yu, Minuk Seung \| Korea Atomic Energy Research Institute, Inyong Kwon\|Korea Atomic Energy Research Institute | Korea University |

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|---|---|---|---|
| 202003110 | Application specific integrated circuits (ASICs) Pre-amplifier design for Radiation Application | waseem muhammad, Byeongjae Yu, Minuk Seung \| Korea Atomic Energy Research Institute, Inyong Kwon\|Korea Atomic Energy Research Institute | Korea University |
| 202003111 | Energy-efficient configurable LSTM accelerator for mobile systems | Junseo Jo, Gunho Park, Jongmin Park | POSTECH |
| 202003112 | A DC-6 GHz gm-C True-Time Delay in 65 nm CMOS process | Yunsik Na, Munkyo Seo | Sungkyun kwan University |
| 202003113 | DTLS Supporting Crypto Chip(Optimized architecture) | Haeyoung Kim, Janghyun Ji, Jinjae Lee | Pusan National University |
| 202003114 | DTLS Supporting Crypto Chip(optimized algorithm) | Haeyoung Kim, Janghyun Ji, Jinjae Lee | Pusan National University |
| 202003115 | An Implementation of Load Balancing Scheme with hybrid CPU-FPGA system for Real-Time Ray Tracing of Dynamic Scenes | Lee Jin Young, Chung Woo Nam, Lee Tae Hyoung | Sejong University |
| 202003116 | Design of Cardiac Status Indicator and R-R Interval Adjustment Circuits | sandhya surendar Raj, Yoon Woo Kim, palagani yellappa, Jun Rim Choi | Kyungpook National University |
| 202003117 | A 0.42 - 3.45 Gb/s Referenceless Clock and Data Recovery Circuit with Counter-based Unrestricted Frequency Acquisition | Kyungsub son, Sanghun Baek | Inha University |
| 202003118 | A Low-Complexity Heartbeat Indicator using R-R Interval for Wearable ECG Devices | Yoon Woo Kim,Sandhya Surendarraj, Jun Rim Choi | Kyungpook National University |
| 202003120 | Balancing scheme for phase current and flying-capacitor voltage in 3-level DC-DC converter | Chan Ho Kye, Minho Choi, Deog Kyoon Jeong | Seoul National University |

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