

Kenneth Michael Shultz

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Profile

Young electrical engineer with an aptitude for creative problem solving and analysis. Excellent team skills and strong communication abilities. Specialized in MCUs, integrated circuits, and micro-fabrication.

Education

B.S. ELECTRICAL ENGINEERING & B.A. PIANO

VIRGINIA COMMONWEALTH UNIVERSITY

- **4.0 GPA**, Electrical Engineering
- **First Place**, Senior Design Semiconductor Exposé, 2010
- **Medal of Honor for Highest Efficiency**, Solar Design & Fabrication Cup, 2010
- **Finalist**, National Critical Language Scholarship for **Mandarin Chinese**, 2009
- **Founder & President**, Mandarin Chinese Studies (MCS), 2008

Skills

Integrated circuit design, micro-fab process design, product development, technical writing, and product prototyping using assembly language, C, C++, MATLAB, real-time DSP, Microsoft Office, IC Station (CAD), Ansoft, and P-SPICE

Relevant Experience

EXHIBIT DESIGN ENGINEER, THE SCIENCE MUSEUM OF VIRGINIA

SUMMER 2010

- Was given a \$60,000 budget to complete this brand new, 1,800 square foot innovation exhibit
- Proposed and designed a Science Museum of Virginia application for the iPad, iPhone, and iPod Touch
- Engineered a micro-controller based, intuitive-touch collaborative digital workstation ([view](#))

PROCESS ENGINEERING INTERN, VIRGINIA MICROELECTRONICS CENTER

2009-2010

- Designed glass lithography mask sets used to fabricate devices on 100 mm silicon wafers
- Engineered and optimized lithography, oxidation, metallization, chemical etching and dopant diffusion process steps
- Analyzed results with SEMs, ellipsometers, profiling systems, I-V-C probing stations, and various other instruments

FOUNDER, RIS RECORDING STUDIOS

2004-PRESENT

- Produced two recordings featured on MTV's *Newport Harbor*
- Focussed on customer needs and maintaining healthy, long-term relationships
- Programmed a 3-band equalizer design software ([view](#))

Portfolio Features

17% EFFICIENT SINGLE JUNCTION SILICON SOLAR CELLS

2010

- Process yielded 16 out of 16 working devices for 6 out of 6 wafers
- Cells yielded the highest efficiencies in the Solar Design & Fabrication Cup ([view](#))

ONE-TOUCH COLLABORATIVE MEDIA

2010

- MCU (C programming) based technology implementing capacitive touch sensors and a serial port I/O HDMI switch
- Technology intended for intuitive plug-and-play laptop collaboration ([view](#))

DA VINCI CENTER FOR PRODUCT INNOVATION

2010

- Hand selected by VCU School of Business to work with 2 engineering, 2 business, and 2 art students
- Collaborated with museum CEO, Board of Directors, Director of Technology, and Director of Marketing ([view](#))

TRANSMISSION LINE IMPEDANCE MATCHING AND TUNING GUI

2009

- Program provides impedance matching for stub tuning, L-networks, and quarter waver transformer techniques
- Reflection coefficients as a function of frequency displayed on a Smith chart and Cartesian coordinates ([view](#))

MEMORY RESISTORS

2009

- Was given over \$5,000 worth of raw materials to design the lab's first experiments with these revolutionary devices
- Teamed-up with Ph.D. student with common research interests in pursuit of further experimentation ([view](#))

3-BAND EQUALIZER GUI

2009

- User adjusts gain, quality factor and phase for each band while software graphs time and frequency domain data
- When desired filter is achieved, the programs prints capacitor and resistor values required to build the filter ([view](#))

AUTONOMOUS ROBOT

2009

- Robot could solve mazes, follow lines, and draw pictures
- Programmed in C on a PIC32 MCU to control four reflectance sensors, two motors, and one distance sensor ([view](#))

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Curriculum Vitae

ELECTRONIC DEVICES

Electrostatics, quantum mechanics, energy band diagrams, carrier modeling, carrier action, P-N junctions, BJTs, FETs

SEMICONDUCTOR FABRICATION PROCESSES

Modeling of process steps for CMOS, NMOS, PMOS, and MEMS

SIGNALS AND SYSTEMS

Fourier series, Fourier transform, Laplace transform, transfer functions, probability, statistics

INTEGRATED CIRCUITS

Analog filter design, CMOS digital logic design, BJT and FET power amplifier stages, operation amplifier stages

MICROWAVE AND PHOTONICS

Transmission lines, impedance matching, Smith Chart, fiber optics, wave guides, laser diodes, photodiodes, Snell's Law

COMMUNICATIONS

Angle modulation, phase modulation, A to D conversion, analysis of noise in analog systems, correlation

MICROCOMPUTERS

Assembly and C programs for 32 bit MCU peripheral control (e.g. LCD display calculators, autonomous robots, etc.)

C++

Basic algorithms and applications, functions, classes, structures, repetition, pointers, vectors, arrays, file I/O

DIGITAL SIGNAL PROCESSING USING MATLAB AND C

DTFT, DFT, FFT, z-transform, FIR filters, IIR filters, adaptive filtering, real-time MCU processing, data compression