BENJAMIN GOTTEMOLLER

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WORK EXPERIENCE

SteadyMouse, LLC., Princeville, IL
2016 - Present

- Founded the small business, SteadyMouse, LLC., in July of 2016 to professionally support a commercial version of the SteadyMouse application, an assistive technology project started in 2005
- Designed and developed the SteadyMouse software itself as a novel solution to remove hand tremors from cursor motion for users with Parkinson's disease and Multiple Sclerosis
  - The free version of SteadyMouse has seen installation on more than twenty-thousand computers worldwide
  - Completely refactored the original C++ codebase over a two year period to develop a high end commercial version launched in September of 2016
- In addition to software work, designed, modeled, and brought to market a 3D printed impeller for Breville coffee grinders
  - Having automated everything, the product is selling over forty units per month, worldwide, with minimal interaction

Caterpillar, Inc., Peoria, IL
2004 - Present

- Principal Software Engineer for production electric drive ECU firmware applications
- Designed and developed applications running in production on thousands of electric drive machines worldwide
  - This includes the D7E tractor, Caterpillar's first ever electric drive product
  - Covers hybrid electric tractors, trucks, pavers, locomotives, and wheel loaders while retaining more than 80 percent re-use of the codebase between applications
  - Achieved multi-platform cross-compilation of the codebase spanning three generations of ECU hardware and five platforms in all
- Architected and developed "multiapp" capability whereby more than one electric machine can be controlled by a single ECU, saving more than $650 per machine
  - The design strictly enforces separation-of-concerns via preprocessor directives, such that within the codebase it is always clear which application is being looked at and accidental mixing results in compilation errors
- Designed and implemented a build system based on OSS SCons, enabling fast, maintainable and repeatable compilation for production electric drive applications
- Implemented a "stealth flash" capability, whereby an ECU can detect a problematic aftermarket product on the CAN datalink and automatically flash new firmware during machine downtime
- Invented a FPGA content description layer allowing embedded C applications to query what features and sub-features exist within a given pattern prior to attempting to use them
- Received the following patents for work related inventions:
  - US8054016 "Retarding energy calculator for an electric drive machine"
  - US9091569 "Opacity-based rotary position sensor and method"
  - US8981685 "Controlling retarding torque in an electric drive system"
  - US9063202 "Method and apparatus for detecting phase current imbalance in a power generator"
  - US8970291 "Method of debouncing a variable frequency step signal"
  - US7994798 "Power converter current sensor testing method"

EDUCATION

University of Illinois at Urbana-Champaign
2000 - 2004

- B.S. in Computer Engineering
- Received 1st place at the 2003 UIUC Engineering Open House for an exhibit on "Asymmetric Capacitor Thrusters"
- Recipient of the 2003 "Donald L. Bitzer and H. Gene Slottow Creativity Award"

TECHNICAL SKILLSET

PROGRAMMING LANGUAGES
- C
- C++
- Python
- Assembly
  - x86
  - PowerPC
- Simulink
- PHP

PROGRAMMING EXPERIENCE
- Embedded development
- Model based control systems
- Hardware abstraction
- Windows development
  - WinAPI, MFC
- Controller Area Network
- Power electronics control systems
- Board bring-up
- RTOS configuration
- Profiling and debugging
- Software optimization
- Build environment setup
- Computer graphics
  - OpenGL, DirectX, SDL
- Web development
- FPGA

TOOLS
- WindRiver Diab Compiler
- Microsoft Visual Studio
- GNU Compiler Collection
- Matlab / Simulink
- Git
- ClearCase
- Vector CANape
- Vector CANalyzer
- Lauterbach Trace32 Debugger
- Linux
- Apache
- Blender 3D

ACHIEVEMENTS

- Eagle Scout rank in the Boy Scouts of America