

Alexander DeTrano

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Portland, OR

EDUCATION

NEW YORK UNIVERSITY

MS IN ELECTRICAL ENGINEERING
2015 | New York, NY

VILLANOVA UNIVERSITY

BS IN ELECTRICAL ENGINEERING
Minor in Mathematics
2010 | Villanova, PA

SKILLS

SOFTWARE

Verdi • DVE • DVT • JasperGold
Formal Property Verification •
JasperGold Security Path Verification

PROGRAMMING

Code Review:

SystemVerilog • Verilog • C • C++ •
x86 Assembly • ARM Assembly • Java
• Python

Code Writing:

Python • C • C++ • Bash • MATLAB
L^AT_EX

EXPERIENCE

INTEL CORP | SECURITY RESEARCHER

June 2015 – Present | Hillsboro, OR

- Pre-silicon security assurance for Intel architectures across a variety of market segments (client chipset, wearables, IOT, automotive)
- Threat modeling, risk assessment, vulnerability analysis, design and implementation review for a number of Intel products
- Participate in hardware/firmware/software hackathons
- Collaborate with cross-discipline teams in multiple geolocations to recommend bugfixes and ultimately resolve security vulnerabilities
- Developed a tool in Python to speed-up reviewing register files

INTEL CORP | SECURITY VALIDATION ENGINEERING INTERN

Jan 2015 – May 2015 | Hillsboro, OR

- Developed hardware security guidance for 3rd-Party IP (3PIP) providers. The guidance focused on actionable insights that a 3PIP provider with no security knowledge could use to reduce the most common pre-silicon bugs.
- The 3PIP HW security guidance was added as part of Intel's Secure Design Lifecycle.
- Developed a tool in Python to help automate many tasks involved in performing security validation of IPs. The tool provided an easy way to scrub IP assets.

RESEARCH

ATTACKING A MASKED SOFTWARE IMPLEMENTATION OF THE ADVANCED ENCRYPTION STANDARD (AES) | NYU

2014 | New York, NY

- Recovered the secret encryption key from a masked implementation of AES-256 on an Atmel ATmega-163 smart-card using 15 power traces
- First attack targeted the loading of the masks from memory, and recovered the mask with 91% success
- Second attack identified collisions between two AES S-Boxes and recovered the difference between bytes of the key, reducing brute-force attack complexity from 2^{128} to 2^8
- Both attacks coded in MATLAB and were accepted to the [DPA Contest V4](#).

PUBLICATIONS

- [1] A. DeTrano, S. Guilley, X. Guo, N. Karimi, and R. Karri. [Exploiting Small Leakages in Masks to Turn a Second-order Attack into a First-order Attack](#). In *Proceedings of the Fourth Workshop on Hardware and Architectural Support for Security and Privacy*, HASP '15, New York, NY, USA, 2015. ACM.