Alexander W. Dent

Senior Director of Security Engineering

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Summary

Senior technical leader in the security architecture community within Qualcomm Technologies, Inc., working with hardware and software teams to determine the appropriate architectures for extremely complex system-on-chip designs, and ensure execution that translates the designs into essential security features.

Unique skill set derived from a history of research in mathematical cryptography as a professor in the University of London and development of security features for SOCs at Qualcomm.

Employment History

Qualcomm Technologies, Inc.

*Senior Director of Engineering
(since Nov 2021)*

*Director of Engineering
(June 2019 – Nov 2021)*

*Principal Engineer
(Nov 2017 – June 2019)*

*Senior Staff Engineer
(Nov 2014 – Nov 2017)*

*Staff Engineer
(July 2011 – Nov 2014)*

Experienced group leader with responsibility for groups of up to fifty security engineers. Experience in evaluating and coaching high-title engineers and team leaders.

Currently Senior Director in charge of the System Security Engineering and Research team which develops long-term security architectures that will meet the security challenges for devices for decade.

Consultant architect on all aspects of Qualcomm's security architecture, including secure boot, trusted execution environments, secure root of trust processors, secure debug, secure device provisioning, licensing, and others.

Co-designer of Qualcomm's "double-signing" secure boot architecture. Member of the core design team for Qualcomm's secure root of trust ("Trust Management Engine").

Trusted leader working with dozens of cross-functional teams with different perspectives.

Also, currently Senior Director in charge of the Cryptographic Operations Group which manages Qualcomm's high-value key material and develops high-assurance services to users to access those keys in a secure and auditable manner.

Experience in driving cross-functional teams to complete high-assurance, high-security certification requirements. Notably, chairing the technical committee of leaders responsible for meeting the SAS-UP certification requirements for iSIM provisioning and driving completion of technical certification audit. Experience in working with Common Criteria.

Experience in vulnerability analysis of software written in C and development of training courses on secure code development that are used across the organisation.

Royal Holloway, University of London

Associate Professor
(Nov 2009 – July 2011)

Extensive research on public-key algorithms and protocols including 21 peer-reviewed conference papers, 9 peer-reviewed journal papers, and 2 books.

Assistant Professor
(Jan 2006 – Nov 2009)

Supervisor of two doctoral student theses in cryptography.

Research Assistant
(Sep 2001 – Jan 2006)

Supervisor of over thirty M.Sc. student theses covering all aspects of information security.

Served as UK expert on the ISO/IEC SC27/WG2 standardisation committee for the standardisation of practical cryptography and protocols.

Education

University of London
(Oct 1998 – Sep 2001)

Ph.D. in Mathematics.

Thesis in combinatorial mathematics. Funded through a CASE award from RACAL (now Thales).

University of Oxford
(Sep 1994 –Jul 1998)

M.Math. in Mathematics.

Class I degree. Charles Caine Mathematics Prize.

Key Skills

- Team leadership and staff development for high-achieving engineers.
- Efficient design and execution process development for cross-functional teams.
- Design and risk analysis of security systems in multi-stakeholder systems.
- Design and risk analysis of security systems across the hardware/software boundary.
- Design and risk analysis of PKI systems and operational support processes.
- Expert understanding of practical and theoretical cryptography including protocol design.
- Syllabus design, lecture development and teaching/learning experience.
- Implementation and review of secure source code in C.
- Familiarity with Python development.