Trusted Systems   November 6, 2017
Data61

Dr. Klein,

I would like to express my interest in the open position for a Proof Engineer in the Trusted Systems team. I believe my background makes me a suitable candidate.

As an undergraduate student at UNSW, my studies focused on theoretical computer science with an emphasis on language semantics and verification methods. I balanced this with some systems programming coursework, particularly the operating systems courses.

I continued this interest in semantics and verification in my part-time work with NICTA and Data61, first working with Dr. Franck Cassez on modelling techniques, and later with Dr. Toby Murray on security semantics. In my work with Dr. Murray I gained familiarity with Isabelle.

At Cog Systems I worked in small to medium-sized teams solving a variety of practical problems, while demonstrating an ability to quickly adapt to a range of development environments and tools.

Additionally, I have worked on both projects using modern development techniques such as version control and regression testing, as well as projects *without* these techniques. I am now strongly motivated to promote and maintain the use of these techniques.

I've always been interested in models and correctness, and appreciate the utility of these concepts to software engineering. I would love the opportunity to further develop my skills in this area, while helping to advance the wider adoption of formal methods in industry.

Regards,

Edward Pierzchalski

521 Anzac Parade – Kingsford 2032

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Edward Pierzchalski

Employment History

Cog Systems

Software engineer, January 2017 to present
- Developed okL4 modules, Linux devices, and Python tools to test for passwords in physical memory on a hypervised Android system, as well as a partitioned, encrypted disk service.
- Migrated a large internal project to use version control appropriately.
- Integrated an embedded Rust project with an okL4 system as part of a well-received internal presentation.

Data61

Research assistant, July 2014 to November 2015, February 2016 to November 2016
- Independently investigating formal semantics of concurrent security-sensitive programs, with a focus on value-dependent classification.
- Developed judgment systems to help automate analysis of security properties in a simple imperative language.
- Verified properties of judgment system using Isabelle.

Google Australia

Engineering intern, November 2015 to February 2016
- Extended collection of public user G+ post data, applied indexing and text salience techniques to extract popular content. Written in Go.
- Demonstrated ability to communicate and coordinate with offsite teams, coding and execution skills, and ability to familiarize myself with internal tools.

NICTA

Software engineering intern, March 2013 to July 2014
- Engineer on the *Perentie* team, an experimental software verification tool written in Scala. Participated in SV COMP 2015, a software verification competition. *Perentie* ranked third in its category after less than a year of development.
- Designed intermediate languages to represent and simplify C program semantics.
- Helped design and implement an embedded domain-specific language for interacting with SMT solvers.

Education

University of New South Wales
- Bachelor of Science (Mathematics), graduated February 2016
- Bachelor of Science (Computer Science), graduated February 2017 with honours

Awards
- Google Third Year Prize
- CSE Undergraduate Performance Prize Year 3, 4th Place

Notable Work

Advanced Algorithmic Verification: Gained experience using Isabelle, an interactive theorem prover. Formally verified a simple C program. Ranked 1st in the course.
Concepts of Programming Languages: Implemented a small Haskell variant, including typechecker. Ranked 1st in the course.
Advanced Operating Systems: Wrote a kernel on top of the seL4 microkernel, written in Rust.

Skills

- Experienced in research and software development, independently or in small to medium teams.
- Strong background on functional programming, language design and semantics, and systems programming.
- Proficient in Rust, C, Haskell, Python, Bash, Isabelle, LATEX, and Scala.

Publications

Franck Cassez et al. "Perentie: Modular Trace Refinement and Selective Value Tracking". In: *Tools and Algorithms for the Construction and Analysis of Systems*. 2015, pp. 439–442.
Toby Murray et al. "Compositional Verification and Refinement of Concurrent Value-Dependent Noninterference". In: *IEEE Computer Security Foundations Symposium*. Lisbon, Portugal, June 2016.

References

Dr. Toby Murray: Undergraduate thesis supervisor, research lead.
Email: toby.murray@unimelb.edu.au.
Richard Vagg: Principle Engineer at Cog Systems.
Email: richard@cog.systems.

Name: Pierzchalski,Edward Aleksander
Student ID: 3379830

Academic Career 1 of 1: Undergraduate
Beginning of Undergraduate Record

Semester 1 2011

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2011 S1 COMP1917 Computing 1                    6.00    6.00   54   PS
2011 S1 MATH1141 Higher Mathematics 1A          6.00    6.00   80   DN
2011 S1 PHYS1131 Higher Physics 1A              6.00    6.00   66   CR
2011 S1 SCIF1121 Advanced Science: PPP          6.00    6.00   53   PS
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Term WAM: 63.250 Term Totals   24.00   24.00
Good Standing

Semester 2 2011

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2011 S2 COMP1927 Computing 2                    6.00    6.00   79   DN
2011 S2 MATH1081 Discrete Mathematics           6.00    6.00   75   DN
2011 S2 MATH1241 Higher Mathematics 1B          6.00    6.00   81   DN
2011 S2 PHYS1231 Higher Physics 1B              6.00    6.00   69   CR
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Term WAM: 76.000 Term Totals   24.00   24.00
Good Standing

Semester 1 2012

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2012 S1 COMP2041 Software Construction          6.00    6.00   83   DN
2012 S1 COMP2111 System Modelling and Design    6.00    6.00   85   HD
2012 S1 MATH2111 Higher Several Variable Calc   6.00    6.00   73   CR
2012 S1 MATH2901 Higher Theory of Statistics    6.00    6.00   84   DN
2012 S1 PHYS2040 Quantum Physics                3.00    3.00   79   DN
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Term WAM: 81.000 Term Totals   27.00   27.00
Good Standing

Semester 2 2012

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2012 S2 COMP2121 Microprocessors & Interfacing  6.00    6.00   78   DN
2012 S2 COMP2911 Eng. Design in Computing       6.00    6.00   63   PS
2012 S2 MATH2130 Higher Math Methods for DEs    3.00    3.00   72   CR
2012 S2 MATH2601 Higher Linear Algebra          6.00    6.00   86   HD
2012 S2 MATH2620 Higher Complex Analysis        3.00    3.00   78   DN
2012 S2 PHYS2050 Electromagnetism               3.00    3.00   88   HD
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Term WAM: 76.889 Term Totals   27.00   27.00
Good Standing

Semester 1 2013

2013 S1 COMP3821 Ext Algorithms&Prog Techniques   6.00   6.00   97   HD
2013 S1 COMP9334 Systems Capacity Planning   6.00   6.00   85   HD
2013 S1 COMP9417 Machine Learning & Data Mining   6.00   6.00   87   HD
2013 S1 MATH3711 Higher Algebra   6.00   6.00   77   DN

Term WAM: 86.500 Term Totals   24.00   24.00
Good Standing

Semester 2 2013

2013 S2 COMP3421 Computer Graphics   6.00   6.00   96   HD
2013 S2 COMP4121 Advanced & Parallel Algorithms   6.00   6.00   90   HD
2013 S2 MATH2931 Higher Linear Models   6.00   6.00   77   DN
2013 S2 MATH5905 Statistical Inference   6.00   6.00   76   DN

Term WAM: 84.750 Term Totals   24.00   24.00
Good Standing

Semester 1 2014

2014 S1 COMP3153 Algorithmic Verification   6.00   6.00   80   DN
2014 S1 COMP4128 Programming Challenges   0.00   0.00   NF
2014 S1 COMP4141 Theory of Computation   6.00   6.00   85   HD
2014 S1 MATH3871 Bayesian Inference and Comp   6.00   6.00   75   DN
2014 S1 MATH3901 Higher Prob & Stochastic Proc   6.00   6.00   57   PS

Term WAM: 74.250 Term Totals   24.00   24.00
Good Standing

Semester 2 2014

2014 S2 COMP3161 Concepts of Programming Lang.   6.00   6.00   100   HD
2014 S2 COMP4161 Advanced Verification   6.00   6.00   100   HD
2014 S2 COMP4920 Management and Ethics   6.00   6.00   72   CR

Term WAM: 90.667 Term Totals   18.00   18.00
Good Standing

Summer Semester 2015

2015 X1 COMP4930 Thesis Part A   6.00   6.00   SY

Term Totals 6.00 6.00

Semester 1 2015

2015 S1 COMP3891 Ext Operating Systems	6.00	6.00	82	DN
2015 S1 COMP9243 Distributed Systems	6.00	6.00	71	CR

Term WAM: 76.500   Term Totals   12.00   12.00
Good Standing

Semester 2 2015

2015 S2 COMP4941 Thesis Part B	12.00	0.00		AW
2015 S2 COMP9242 Advanced Operating Systems	6.00	6.00	83	DN

Term WAM: 83.000   Term Totals   18.00   6.00
REFERRAL

Semester 1 2016

2016 S1 COMP4930 Thesis Part A	6.00	6.00		SY
2016 S1 COMP6752 Modelling Concurrent Systems	6.00	6.00	85	HD
2016 S1 COMP9319 Web Data Compression & Search	6.00	6.00	78	DN

Term WAM: 81.500   Term Totals   18.00   18.00
Good Standing

Semester 2 2016

2016 S2 COMP4941 Thesis Part B	12.00	12.00	81	DN

Term WAM: 81.000   Term Totals   12.00   12.00
Good Standing
3972 Advanced Science Totals
WAM: 74.559 Units: 102.00   102.00
3983 Science/Computer Science Totals
WAM: 78.797 Units: 192.00   192.00
4515 Comp Sci & Eng (Honours) Totals
WAM: 80.143 Units: 66.00   54.00

Prizes
This section acknowledges the student was awarded a university prize for
academic achievement on the recommendation of the Head of
School
2013
The Google Third Year Prize for Computer Science and Engineering
for the best performance in any three of the courses in the School of Computer
Science in
COMP3111/3121/9243/3141/3131/3171/3231/3411/3421/3821/4121

The CSE Undergraduate Performance Prize Year 3, 4th Place
for academic excellence in CSE Courses