Curriculum vitae

Greg Gamble

Summary

I have degrees in Electrical Engineering, Computer Science and Mathematics, and have particular skills in the use of the computer algebra systems Magma and GAP 4, software documentation and the provision of interfaces to facilitate the accessibility of documentation. Most recently I have developed interactive interfaces to standalone C programs from within GAP 4, the result being the two GAP 4 packages ACE and the soon-to-be-released ANUPQ. In my previous position, I developed a Magma program to search for defining sets of designs, and did some Linux system administration which utilised my skills in writing `perl` programs. I am also skilled as a teacher, through my many years' tutoring in engineering and mathematics and some lecturing.

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* A hyperlinked version of this curriculum vitae is available at:

`http://www.math.rwth-aachen.de/~Greg.Gamble/cv.html`

(this may be more convenient for linking to the software URLs given).

Personal

Name: Gregory Alexander Gamble

Nationality: Australian

Date & place of birth: May 22, 1958 (Canberra, Australia).

Spouse: Lyndall Andrews

Children:
Ross Gamble (born: Jan. 17, 1991),
Frances Gamble (born: Oct. 7, 1994).

For Correspondence

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AUSTRALIA.

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Most Recent Position

Postdoctoral position
Graduiertenkolleg Analyse und Konstruktion in der Mathematik
Templergraben 64
Lehrstuhl D für Mathematik
RWTH Aachen
52062 Aachen, GERMANY

Education

Secondary:
St. Edmund's College, Griffith ACT
Chevalier College, Bowral NSW

Tertiary:
University of New South Wales
University of Western Australia

Degrees:

1981: BSc (Computing) *UNSW*

1983: BE (Electrical) *UNSW*

1985: MMath *UNSW*

1998: PhD (Mathematics) *U. West. Aust.*

Academic Awards:

1983: Commonwealth Postgraduate Research Award (1 year) – for MMath.

1990–1993: UWA Studentship ($3\frac{1}{2}$ years) – for PhD.

Other Awards:

1975: Outstanding Service to Fellow Students (Chevalier College)

1984: Sports Recognition Award (UNSW)

Employment Record/University Studies/Teaching Experience

2001: February – October: Graduiertenkolleg (Graduates College) *Analyse und Konstruktion in der Mathematik* Postdoctoral position at RWTH Aachen.
Developed two GAP 4 packages: ACE (Advanced Coset Enumerator) and ANUPQ (p-quotient).

1998–2000: June 1998 – 2000: Research Fellow, University of Queensland.
Research in *Algorithms for Combinatorial Computation* (supported by an ARC (Australian Research Council) grant held jointly by the Mathematics and Computer Science & Electrical Engineering departments). In 1999, gave lectures for *Algorithm Analysis and Design* and supervised and marked the honours project course, *Advanced Algorithms and Data Structures*. Provided Linux system administration support. Maintained computer algebra software (Magma, GAP and quotpic), and made their documentation easily accessible via the web. Research conducted on defining sets of designs (software written as packages using Magma intrinsics), and initiated development of the GAP 4 package ACE (Advanced Coset Enumerator).

1998: February – May: Research Associate, University of Western Australia.
Provided support for a web-based Masters in Mathematics for Information Technology Course. This entailed the production of web-based notes in HTML, produced via LaTeX2html which interfaced with Mathematica notebooks.

1994–1998: Writing up and submission of PhD.
In parallel with this, I had a number of part-time positions: tutor for the UWA Mathematics Department (1995, 1997), Year 9 mathematics teacher at Perth Waldorf School (1995), lecturer for a high-school enrichment course for Pacific Mathematics Olympiad candidates at UWA (1995), lecturer for the UWA Academy for Young Mathematicians (1995–1997), one-to-one tutor for Aboriginal Tutorial Assistance Scheme at UWA (1995–1997), examination scribe (1995–1997), programmer – to install TeX software (1996), one-to-one tutor – 1st year Functional Programming (1996), computing demonstrator for UWA Mathematics Department (1997), computing tutor for UWA Mechanical and Materials Engineering Department (1997), tutor and marker for UWA Calculus Bridging Course (Jan. – Feb. 1998).

1990–1993: Full-time research toward mathematics PhD.
Supported for the first $3\frac{1}{2}$ years by a UWA Studentship. During 1990, I was also a part-time mathematics tutor at UWA.

1985–1989: Full-time mathematics tutoring (now: Lecturer Level A) positions.
At Macquarie University, where I tutored first- and second-year subjects (1985); and at Melbourne University, where I tutored logic, first-year advanced and ordinary-level and engineering mathematics and some second-year mathematics (1986–1989) – this included preparation of problem sheets (1987–1989) and writing assignment solutions for the first-year advanced and ordinary level mathematics courses using TeX (1989).

1979–1984: Full-time study for BE (1979–1982), BSc (1980), and MMath (1983–1984) degrees.
The BE BSc course was a double-degree upgrade of the BSc (Engineering) course

undertaken in (1976–1978). In parallel with this, I drove taxis (1979–1984), and did part-time tutoring at the UNSW Electrical Engineering School (1981–1982), first- and second-year algebra mathematics tutoring and first-year computer demonstrating for the UNSW Mathematics School (1983–1984). My MMath was supported during 1983 by a a Commonwealth Government Research Award.

1976–1978: Part-time study for BSc (Engineering), while an Engineering Assistant (full-time) for the NSW Public Works Department.

Research

Research Interests:

Permutation Groups, Combinatorics, Computer Algebra, Designs, Number Theory, Galois Theory.

Most Recent Research:

2001: *Graduiertenkolleg Postdoctoral position* Completed development of the GAP 4 Package ACE started in my previous position at the University of Queensland. Developed another GAP 4 Package ANUPQ. The ANUPQ Package was previously available as a GAP 3 package. A translation of the original package to GAP 4 was made by Werner Nickel. For each of ACE and ANUPQ, my contribution was to provide an *interactive* GAP 4 interface to an existing C program using GAP 4 iostreams (a feature introduced to GAP 4 in March, 2000), thus providing the interactivity of the standalone program from within GAP.

Past Research:

1998 *Elements of Prime Order in Primitive Permutation Groups*: Thesis for Doctor of Philosophy Degree (UWA). The determination of primitive permutation groups containing an element of degree mp and order p, where p is a prime and $p \leq m \leq p^2$.

1984 *Computation of Galois Groups*: Thesis for Master of Mathematics degree (UNSW). Work entailed extensive Fortran programming, some Macsyma programming and researching of resolvent polynomial and Van der Waerden methods of generating Galois groups associated with polynomials over the rationals.

1982 *Discrete Hankel Transform*: Thesis for Electrical Engineering degree (UNSW). Results analogous to those of the Discrete Fourier Transform were derived.

Software Expertise

Currently, my usual working environment is provided by a Linux or dual-boot Windows98/Linux PC. Previously, I worked mainly on terminals for main-frames operating under UNIX, e.g. SUN Sparc Station or SGI, and I have also worked with Macintosh computers.

Programming languages: C, Fortran, Pascal, Basic, Prolog, Snobol, Various assembler languages.

Applications packages:

Algebra: GAP, Magma, Maple, Mathematica, Macsyma, Cayley, Reduce.

General mathematics: Matlab.

Statistics: Minitab, Splus.

Typesetting: TeX, LaTeX, $\mathcal{AMS}$-TeX, $\mathcal{AMS}$-LaTeX, LaTeX2html, TtH.

World Wide Web: HTML.

Other: Perl, Awk, Sed, Gopher.

Operating Systems:

UNIX, Linux: I have a thorough knowledge of UNIX. I have performed some system administration particularly on Linux, preferring to use `perl`, for tasks that traditionally require the use of `awk`, `sed`, `sh` and `csh`.

DOS, Windows95, Windows98: Some Experience.

Publications and Software

Theses:

- 'Discrete Hankel Transform', *UNSW BE Thesis* (1982), supervised by Prof. A. E. Karbowiak.
- 'Computation of Galois Groups', *UNSW MMath Thesis* (1984), supervised by Dr. David C. Hunt.
- 'Elements of Prime Order in Primitive Permutation Groups', *UWA PhD thesis* (passed 1997), supervised by Prof. Cheryl E. Praeger.

Refereed papers:

- 'Block-transitive 3-designs with affine automorphism group', *J. Geom.* **51** (1994), 36–49.
- 'A first year differential equation', *Aust. Math. Soc. Gazette* **24** No. 4 (1995), 168–172.
- with Cheryl E. Praeger, 'Vertex-primitive groups and graphs of order twice the product of two distinct odd primes', *J. Group Theory* **3** (2000), 247–269.

Research reports:

- 'Block-transitive 3-designs with affine automorphism group', *UWA Research Report* **6** (1992).

Software: An index page linking to a cross-section of the following is available at:
`http://www.itee.uq.edu.au/~gregg/doc-eg/`

LaTeX, BibTeX: Each of the following is available from the TeX web interface listed under Web interfaces below. The software may be downloaded from:
`http://www.maths.uwa.edu.au/computing/software/tex/doc/download.html`

- `uwamaths` package. An omnibus of styles, environments and macros for mathematics department use.
- `uwalet` class. A class for UWA Mathematics Department letters.
- `uwaexam` class. A class for UWA Mathematics Department examinations.
- `uwathes` class. A class for UWA Mathematics Department PhD theses.
- `uwa` and `uwab` bibliography styles. Two variants of a style based on the `abbrev` bibliography style. Their main feature is that adjacent fields are set off by being in different fonts, or by being in quotation marks.

Perl: Each of the following programs gives its own manpage when called with the option `-h`, e.g. `docpack -h`

- `docpack`. Compresses (or decompresses) a tree of HTML files (using `gzip`) taking care not to break any hyperlinks. It does this by first determining an "HTML orbit" of files, modifying the `href` links in these files that are to HTML orbit files, and then it compresses each file in the HTML orbit. It also has a "report" mode, which just reports what files are in the HTML orbit and any "bad links" (hyperlinks to nonexistent files) it finds.
- `htmlls`. Recursively creates HTML contents lists of directories. The idea is to give a listing of files and subdirectories for a web `http` directory similar to that served by web browsers for anonymous `ftp` sites, e.g. see `http://www.itee.uq.edu.au/~gregg/lslist.html`
- `mirrorls`. Compiles a directory listing or compares two mirror sites (for use, when one's `ftp` program does not support a `mirror` option to ensure two mirror sites are synchronised).

GAP 4 packages:

- ACE (Advanced Coset Enumerator). `http://www.gap-system.org/Share/ace.html`
- ANUPQ (p-quotient). Prerelease version available at: `http://www.math.rwth-aachen.de/~Greg.Gamble/anupq.html`

MAGMA package:

- `dsgn-package.tar.gz`. Interfaces with a design completion C program. It was used to generate the nests of designs listed under web interfaces below. Currently, the documentation is not designed for a novice user. Available from: `http://www.itee.uq.edu.au/~gregg/doc-eg/`

Web interfaces:

TEX, LATEX: A comprehensive interface to documentation and hints on usage of tools and packages associated with TEX and LATEX. `http://www.maths.uwa.edu.au/computing/software/tex/doc/`

GAP documentation: Interface to all GAP-associated software available at UQ ITEE Department. `http://www.itee.uq.edu.au/~gap/`

MAGMA documentation: Interface to all MAGMA-associated software available at UQ ITEE Department. `http://www.itee.uq.edu.au/~magma`

Nests of designs: `http://www.itee.uq.edu.au/~gregg/4Anne/`

Simple group presentations: `http://www.itee.uq.edu.au/~gregg/4George/`

PGRelFind: A GAP example that demonstrates how the deficiency of some perfect groups may be determined. The software is provided with the ACE package. `http://www.gap-system.org/Info/examples.html`

Web-based lecture notes:

Academy for Young Mathematicians: `http://www.maths.uwa.edu.au/~gregg/Academy/`

Acknowledgements:

GAP documentation tools: I'm currently listed as maintainer of the documentation tools used for GAP 4.3, which is very near release. For a preview of the GAP 4.3 documentation see:
`http://www.math.rwth-aachen.de/~Greg.Gamble/gap4r3/doc/`.

MAGMA: I beta-tested the Permutation Groups module of MAGMA. My contribution is acknowledged in *Handbook of Magma Functions* by Wieb Bosma and John Cannon. One of my *"for fun"* MAGMA solutions appears on page 1 of *Solving Problems with Magma* by Wieb Bosma et al.

Papers: I am acknowledged for the computing assistance I provided in the following papers:

- A. Baliga and K. J. Horadam, 'Cocyclic Hadamard matrices over $Z_t \times Z_2^2$', *Australas. J. Combin.* **11** (1995), 123–134.
- Colin M. Campbell, George Havas, Alexander Hulpke, and Edmund F. Robertson, 'The simple group $L_3(5)$ is efficient', *Communications in Algebra*, (to appear c. 2001).

Papers in preparation:

- with Barbara M. Maenhaut, Jennifer Seberry, and Anne Penfold Street, 'Further results on secret sharing schemes'.

SPORTING ACTIVITIES

I have been a keen squash player. I was a member of UNSW Squash Club (1976–1984) and Captain of UNSW Squash Club (1980–1984), receiving a Sports Recognition Award (for my services as Captain) in 1984. I was a member of Melbourne University Squash Club (1986–1989) and record-keeper for that club (1987–1989), during which time I rewrote the existing record-keeping computer program and wrote many other programs for their management. I was a member of UWA Squash Club (1990–1991). During 1978–1987, I represented UNSW three times and Melbourne University once at Squash intervarsities.

REFEREES

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