Dr Robin Sterling

33 Primrose Lane, Soham, Cambridgeshire, CB7 5YY ●
Mobile: +44 (0)7811 160389 ● RobincSterling@gmail.com
Website: www.RobinSterling.com Twitter: @RC_Sterling
LinkedIn: https://uk.linkedin.com/in/robin-sterling-b3821235

R&D Engineer

I am currently an R&D engineer for SureFlap Ltd, with a background in physics. My role is to research and develop novel RFID based technologies to enable the latest range of animal care products. The process includes both theoretical and practical design of new, custom hardware and firmwire in an extremely cost sensitive market. Recent examples include a new RFID circuit which allows for the miniaturisation and portability of RFID readers in animal collars and a highly sensitive and low cost, highly sensitive proximity sensor for sensing black cats.

I have a background as a physicist, gaining a PhD from Sussex University in quantum computing and holding a postdoctoral research positions at Sussex university and the Weizmann institute. During this time, I published my work on microfabricated atom traps in Nature Communications. I have a comprehensive understanding of physics, specifically relating to vacuum systems, lasers, optics, electronics, numerical simulations and microfabrication. I am experienced in project development and management, from inception through design, testing and to full implementation.

Core competencies

- RFID
- Circuit design
- LT Spice circuit simulation
- PCB design (EasyPC)
- Wolfram Mathematica
- Numerical simulations
- IAR Embedded workbench
- Embedded C
- Prototyping
- Documentation writing
- Problem Solving
- MS Office

Education

- PhD in Physics, specialising in ion trap quantum computation.
  University of Sussex, Oct. 2006 – Apr. 2011
- B.Sc. (Hons.) in Physics with Astrophysics (2:1)
  Keele University, 2003 – 2006

Experience

Nov 2014 – Present

I currently work as an R&D engineer for SureFlap ltd. My role takes me through the entire product development life cycle. I perform proof of principle experiments, develop hardware and write production firmware. My responsibilities include:

- Take a new product concept and research it's feasibility.
- Once feasibility has been demonstrated, develop a cost effect hardware solution.
- Write production firmware.
- Through user testing improve and modify hardware and firmware.
- Produce final designs for hardware for mass production and production firmware.
- Author release documentation for the product.

Jan-April 2014
I was a research fellow at the Weizmann Institute of Science in Israel. My responsibilities were:

- Development of a new imaging system to view the emitted light from a single atom using a CCD camera.
- Addressing single atoms using tightly focused lasers.

Previous experience: Research assistant at the University of Sussex 2012-2013

- Project initiator and leader on the implementation of the first 2-dimensional, microfabricated ion trap array for quantum simulations.
- Investigation of microfabricated surfaces and geometries, relating to the application of radio frequency high voltage and the electrical breakdown processes in vacuum.

Achievements

- Invented a new type of resonant circuit for RFID. This reduces the size and cost of an RFID reader that is to be embedded in a wearable device.
- Developed all hardware and firmware for the SureFlap Sealed Pet Bowl product. Including a low cost, high sensitivity proximity sensor. The Sealed Pet Bowl has currently sold more than 15k units.
- Successful design, construction and operation of the first 2-dimensional microfabricated ion trap lattice. This is an "on chip" device with applications in quantum computing. Published in Nature Communications.
- Developed a process to significantly increase microfabricated device voltage. My process increases the electrical breakdown point on microfabricated devices by a factor of 3.6.
- Detailed numerical simulations used to optimise the microfabricated ion traps. The simulations were of the time averaged radio frequency electric fields generated by arbitrary electrode geometries. Using Mathematica and C. Simulation and experimental data agreed with 99% accuracy.
- Constructed a customised UHV vacuum system to achieve an operating pressure of 10^{-12} Torr.
- Ran two successful Kickstarter campaigns, the first for a hobby electronic dice kit and the second for mathematics based personalised art. Both reached their funding goals in the first couple of days.

Interests

I have a very keen interest in electronics and have become active in the hobby electronics and Hackspace movements. I enjoy inventing new gadgets and devices, examples of these are a haptic vest that translates music into vibrations. This allows the wearer to feel, as well as, hear the music. I have also designed and made several clocks, including a Nixie bargraph clock, which uses two Nixie discharge tubes to display the time, and a Hex Colour Clock. This displays the colour represented by the hexadecimal value of the time. I am also working on a matrix display using hundreds of neon lamps along with others projects.

I also have an interest in wood carvings, using mathematical models to generate interesting surfaces. These are then carved into wood, making personalised furniture and artworks.

In general I am passionate about learning and making, and love to make, build and invent whether at home or at work. Some of my projects can be seen on my website: RobinSterling.com

Courses attended

Nov 2016 - Wolfram Mathematica, The Wolfram Language: Programming Fundamentals
Oct 2016 - Texas Instruments, The Precision Labs Live Experience
Oct 2016 – ST Microelectronics training day

Publications

R. C. Sterling, H. Rattanasonti, S. Weidt, K. Lake, P. Srinivasan, S. C. Webster and W. K. Hensigner (2013) Fabrication and operation of a two-dimensional ion-trap lattice on a high-voltage microchip, Nature Communications, 5:3637.

R. C. Sterling, M. D. Hughes, C. D. Mellor and W. K. Hensinger (2013) Increased surface flashover voltage in microfabricated devices, Applied Physics Letters, 103, 143505.

J. J. McLoughlin, A. H. Nizamani, J. D. Siverns, R. C. Sterling, M. D. Hughes, B. Lekitsch, S. Weidt and W. K. Hensinger (2011) Versatile ytterbium ion trap experiment for operation of scalable ion-trap chips with motional heating and transition-frequency measurements. Physical Review A, 83 (1). 013406.

References

Available on request