Daniel Stonier

Technology/Solutions Developer

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Profile

Contact Details

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Relevant Links

Portfolio[1]
LinkedIn[2]
Github[3]

I enjoy solving problems that reside in the space where algorithms, programming and technology converge on the real world. The reward of watching technology come alive has had a great part in motivating the direction of my career towards a better understanding of how to make this happen. From a mathematics PhD to company as an algorithms developer, control engineer, software architect, innovation team lead and technical program manager, these have all contributed to understanding a significant part of the pipeline involved in the development of technology solutions. My role is more specifically suited to that of a lead software/technology architect or developer with enough experience (and a significant interest) in product and business development to be able to participate in the bigger picture.

Work History

Toyota Research Institute (Cambridge, USA)

Senior Manager / Technical Program Manager - Driving Simulation — *2017-2020*

Lead Developer - fill the role of technical software lead on projects where senior experience is needed
Software Guidance - stay abreadst of team development, provide guidance when needed
X-Team Project Lead - direct development for cross-functional team projects
Alignment - work with other teams/groups to closely align their needs with our deliverables
Team Management - manage day-day activities for the team and optimise our agile environment
Testing Strategies - monitor current approaches, identify and kickstart projects that can deliver value for testing
Looking after the Humans - ensure people are tasked matching their skills, assist them develop their weaknesses, etc.
Research - direct research efforts usefully at short term open questions and long term moonshots
External - direct and co-develop on projects with external groups (TMC/OSRC/Kitware)

Yujin Robot Co. Ltd (Seoul, Korea)

Innovation Team Co-Leader — *2014-2016*

Preparation - formed a proposal and iterated with company executives a restructured plan for Yujin's R&D
Integration - kickstarted the innovation team[4] within the existing company infrastructure as a spin along
Human Resources - hiring for a varied team (hardware, software, business, korean & international) of 10-12 people
Business Ideation - work with a bizdev & product manager to finding new business and product ideas (e.g. gocart[5])
Networking - successfully connected with partners internationally and locally
Prototypes - rapid design and iteration on product ideas (seeing is believing!)
Shows & Field Tests - prepared systems for successful shows and field tests at client facilities
Software Vertical - design and co-ordinate software development from robot firmware through to server and web applications
Service Design - the technology voice in service design, minimise complexity transmitted by software design to users
Quality Assurance - manage testing, continuous integration, deployment for generating reliable software
Collaborate - design, document, package, deliver and issue track the software for other teams and external partners
Navigation - build a multi-floor, multi-context navigation stack with vision slam for robots with a large, rectangular footprint
Behaviour Trees - built a comprehensive implementation to handle decision making and logic inside the robot
ROSCon 2016 - local chair on the organising committee for the conference

Kobuki Project Lead — *2012-2016*

Goal - a robotics research platform to connect us with the intntl dev. community to stimulate hiring & networking potential
Successes - increasing sales for 4+ years, thousands of users & thriving groups around spin-offs (turtlebot[6], deepbot & qbot)
Product Management - co-ordinate software, hardware, manufacturing and marketing for the product, kobuki[7]
Business - linked and launched kobuki in association with the turtlebot platform from OSRF

Lead Developer — *2011-13*

[1] https://snorriheim.atlassian.net/wiki/display/ snorri/Portfolio
[2] https://www.linkedin.com/in/daniel-stonier-95b37522
[3] https://github.com/stonier
[4] http://inno.yujinrobot.com/
[5] http://gocart.yujinrobot.com/
[6] http://wiki.ros.org/Robots/TurtleBot
[7] http://kobuki.yujinrobot.com/

Lead Roles - co-ordinating and assisting where needed in Yujin's control team of approximately 10 people
Human Resources - hiring of new international engineers
New Projects - propose and work with local and international groups on various government funded projects
Algorithms - experimental design/testing of vision slam systems using nonlinear optimisation
Robotics in Concert - lead designer for a multirobot-device framework with OSRF, University of Texas et. al.
Software Manager - manage the open and closed source software (direction, development and quality control)
ROS Contributions - design & dev. of fundamental parts of the robot operating system (build, comms, platforms etc)
ROSCon - speaker at the annual ROS conferences
Academia - panel member for PhD defences both locally and internationally

Cleaning Robot Product Engineer
2009-10

Goal - work with our partner (Philips) and their management team to bring a vision-based robot to market
Successes - made it through the Philips project incubation trials (only 10% succeed) and delivered a product to market
Vision Slam - rebuild an experimental filtering algorithm from academia for vision based navigation with a focus on product
Stabilisation - ensure the automatic navigation is failure free - i.e. for all robots, all environments and all times of the day
Quality - worked with the Philips team to ensure market readiness (incl. 4 weeks of testing on site in the Netherlands)

Senior Control Engineer
2007-10

Control Software Management - integrate Yujin's control systems framework with the ROS framework
Control Software Development - visual servoing, manipulation, embedded systems, path planning, firmware motor systems

Korean Advanced Institute of Science and Technology [KAIST] (Daejeon, South Korea)

Postdoctoral Fellow (Robot Intelligence Lab)
2005-6

Research Areas - nonlinear control for omni-navigation, postural balance for humanoids and fuzzy path planning
Supervision - assisted lab members with theoretical mathematics and directly guided three postgrad students

OPEN SOURCE EXPERIENCE

- **Turtlebot**[8] [2012-15] - responsible for & worked with Willow/OSRF to develop the Turtlebot 2 stack for ROS groovy → melodic
- **RosJava**[9] [2012-14] - worked with Damon Kohler to maintain & provide mature catkin/gradle/maven interfaces for indigo
- **Ros on Windows**[10] [2010-12] - a minimal environment for company & factory software, also turned out to be useful for others
- **Catkin** [2010] - worked with devs at Willow/OSRF in the design phase to enable native cross-compilation/platform build tools.
- **Drake** [2018-21] - a systems framework computational engine used in our autonomous driving simulators.
- **Maintainer** [2008-16] - maintain a great many open source packages, examples include sophus, ecto, kobuki, turtlebot...
- **Contributions** [2008-16] - patches for ros on arm, opencv, redmine and many robotics packages in the ros community
- **Projects** [2008-20] - ecl, py_trees, ros multimaster, message_multiplexing, groot_rocker & many smaller packages for robotics

GENERAL SKILLS

- **Product Development** - have particpated in various parts of the product pipeline for several projects
  - *GoCart* - prototype robotic platform and business solution for autonomous logistics.
  - *Kobuki* - a mobile research base.
  - *Turtlebot 2* - a mobile research platform and software environment.
  - *iClebo* - a vision based cleaning robot developed in co-operation between Yujin & Philips.
- **Bridging Experimental to Product** - taking the new and shiny and incorporating it into product development.
  - *Research* - from academic paper to a level required for a robust product (vision slam for cleaning robots).
  - *Testing* - exposed to paradigms facilitating rapid iteration, as well systems engineering methodologies for scale (TRI)
  - *Software Quality* - understanding where and how to draw the line between rapid delivery and long term sustainability
  - *Timing* - a good track record in selectively introducing or blocking new technologies which become vindicated later and effectively gave us a head start (Linux, Eigen, ROS, Turtlebot 2, Web Tools...).
- **Communication**
  - *C-Level* - worked with our c-level executives to integrate an 'innovation team' into a korean company.
  - *Inter-Company* - connect with external developers and executives to form partnerships (Willow, OSRF, ScanBox, ...)
  - *X-Teams* - worked cross-functionally driving projects spanning teams in a larger organization (TRI Driving).
  - *Small Teams* - have worked in teams of up to 15 people with very mixed skills and cultures (typical robotics team).
- **Solutions**
  - *Nailing It* - never happy until I've dug deep enough to unearth a root cause or identified the existence of a solution.
  - *Decision Making* - having both research and product background makes it easier to make judgement calls on direction.
- **Software**

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[8] http://wiki.ros.org/Robots/TurtleBot
[9] http://wiki.ros.org/rosjava?distro=indigo
[10] https://github.com/ros-windows

- *The Vertical* - developed, mentored and co-ordinated on software from firmware to the web, from design to deployment.
- *Math Background* - easy to pick up new research from many fields and develop/co-ordinate theoretical development.
- **Languages**
  - *English* - native.
  - *Korean* - intermediate, previously lived and worked in Korea (10 years).

Technical Skills

- **C/C+** [*expert*] : mathematical algorithms, templates, metaprogramming, qt, library development, lower and higher level control (motor systems, navigation, manipulation), cross-compiling, bare metal embedded, opengl, simulators and many others.
- **Python** [*expert*] - scripts, graphical interfaces, libraries and frameworks, typically for robots, servers and simulation frameworks.
- **CMake** [*expert*] - used extensively in cross-platform projects and helped design ROS's catkin build environment.
- **Bazel** [*expert*] - used and developed macros, it was the preferred tool for a monolithic repo at TRI.
- **Open Source** [*expert*] - developed, contributed to or co-maintained many open source projects.
- **Issue Tracking & CI** [*expert*] - responsible for issue tracking/continuous integration/deployment operations (e.g. jenkins).
- **Linux** [*expert*] - programming, custom embedded distros, real-time, kernel building, server administration.
- **SysAdmin** [*intermediate*] - performed software related tasks for a company's needs (e.g. wiki, code services, etc).
- **Data Analysis** [*intermediate*] - familiar with data science tooling, e.g. Jupyter, Streamlit and deployment thereof.
- **Web** [*intermediate*] - supervisory experience of a web development team, hands-on development with graphical javascript frameworks (py_trees_js), built user-facing tooling around docker workflows, collaboration with infrastructure and cloud groups to develop cloud pipelines in AWS..
- **Matlab Programming** [*intermediate*] - used while at university to prototype/simulate ideas.
- **Java/Android** [*beginner*] - java, gradle (e.g. rosjava) and simple android interfaces.
- **Document Editing** [*anything*] - latex, markdown, wikis, web presentations.

Education

University of Queensland (Brisbane, Australia)

Bachelor of Engineering — *1991-94,2004*
Electrical Engineering - first class honours.
Hons. Thesis - hardware/software implementation of a robotic vision system.

Bachelor of Science — *1991-94*
Mathematics - honours stream.

Deakin University (Melbourne, Australia)

Doctor of Philosophy (Mathematics) — *1996-2002*
Cocycle Theory - analysis of attractors in non-autonomous dynamical systems.
Non-Autonomous Stability - extending & integrating cocycle and classical theories.
Numerical Analysis - perturbations of automonous systems to non-autonomous systems.

Central Queensland University (Rockhampton, Australia)

Bachelor of Science (Hons.) — *1995*
Mathematics - first class honours.
Hons. Thesis - sliding mode control of robotic manipulators.

Yeppoon State High School (Yeppoon, Australia)

Junior and Senior Dux — *1988,1990*

Non-Curricular Interests

- **Family** - married to a korean with two children, struggling to keep up with their korean!
- **Cycling** - these days just to maintain fitness and enjoy some MTB tours, previously road and track racing.
- **Running/Swimming** - again, also to just maintain fitness and my sanity from day to day.
- **Snowboarding** - the New England mountains have opened up new vistas on life!
- **Chess/Squash** - whenever I can find an opponent and whenever I can find the time!

References

Sam Park (CTO, Yujin Robot)
  Capacity Known - R&D Group Head, direct supervisor
  Email - sampark@yujinrobot.com
  Phone - +82-10-6295-3057

Marcus Liebhardt[11] (Innovation Team Co-Leader, Yujin Robot Autonomous Driving Systems Engineer, Daimler)
  Capacity Known - Team Co-Leader
  Email - ich@marcusliebhardt.de
  Phone - +82-010-3322-0566

Brian Gerkey[12] (CEO, Open Source Robotics Foundation)
  Capacity Known - Collaborative contact on various projects, co-organised ROSCon 2016
  Email - gerkey@osrfoundation.org
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Naveen Kuppuswamy[13] (Robotics Researcher, TRI)
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