# D. Hood

2022 Australian Young Engineer of the Year

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## ABOUT

### Industrious
Commenced university aged 15 and placed at the top of three degrees (undergrad/postgrad), while president/chair of various extracurricular activities.

### Explorer
Lived/worked in 8 countries with 4 local languages; visited 45 countries.

### Proactive
Side-projects include open source contributions (Python 3, OpenCV & Eigen C++ libraries) and hosting workshops; repairing medical equipment in Nicaragua (2015); the Recurse Center "programmer's retreat" (2015); and community-led design projects in Colombia (2016) and Zambia (2013).

### Ambassador
STEM promoter through local outreach events and international TV-, radio- and print-based media coverage of altruistic engineering projects.

Media profiles at dhood.io/#news

## EDUCATION

### M. SC. COMPUTER VISION & ROBOTICS
Highest-ranked graduate

2012-2014; EPFL CH, Heriot-Watt GB, Uni. of Girona ES, Uni. of Burgundy FR; GPA: 9.4/10.0

Autonomous robotics, probabilistic robotics, kinematics, optimisation, multi-sensor fusion, visual perception, advanced image analysis, etc.

### B. MATHEMATICS
University Medalist (top 0.5%)

2007-2011; QUT AU; GPA: 6.94/7.0

Statistics (modelling, analysis) & computational mathematics specialisations.

### B. ENG. (ELECTRICAL)
Engineers Australia Medalist

2007-2011; QUT AU; GPA: 6.89/7.0

Embedded systems & control systems specialisations.

Full course list at dhood.io/#work

## EXPERIENCE

### SENIOR ROBOTICS ENGINEER, INVENTIA LIFE SCIENCE
Mar 2020 – Aug 2022 | Sydney, AU

Lead roboticist on skin-printing robot for burns survivors

- System integrator for the KUKA LBR Med robotic arm, designer of electrical/software architecture towards medical device standards.
- Current finalist in the KUKA Innovation Award - Medical Robotics.

Firmware engineer on 3D bioprinter for cancer researchers

- EEPROM-based firmware identification to support printer fleet with multiple hardware variants; improved Python-based test systems.
- Recipient of the 2020 Fast Company World-Changing Ideas Award - Innovation category.

### SOFTWARE ENGINEER, OPEN ROBOTICS
Feb 2016 – Oct 2018 | Silicon Valley, USA

Robot Operating System Development Team, ROS 2 focus

- Cross-platform development (Ubuntu, Windows, MacOS) of ROS 2 features leveraging layered architecture. E.g. logger system with its core in C, supporting objects in the Python and C++ client libraries.
- Features for Jenkins CI/buildfarm, IDing root-cause of regressions.
- Open source community management: giving update presentations, troubleshooting user systems, soliciting and reviewing contributions.
- Maintainer of ROS 1 package RViz (Qt GUI) and the ROS wiki.

Software lead on "ARIAC" competition (NIST project)

- In-simulation agility challenges and automated scoring for industrial robot competition in Gazebo simulator (AUD25k in prizes).
- Automated generation of Docker images from teams' installation scripts; batch processor evaluating all teams automatically.

### POSTGRADUATE RESEARCHER, CHILI LAB EPFL
Feb – Sep 2014 | Lausanne, CH

Developer of the first robot children can teach to write

- Novel synchronisation of a robot with a tablet to mimic "writing."
- Novel AI for learning models of letters from children's demonstrations.
- Field trials at primary schools within 4 months of start. Publication at HRI'15 with >100 citations & winner of AAAI'15 video competition.

### ELECTRONICS ENGINEER, ISSNIP LAB UNIMELB
Jan – Jul 2012 | Melbourne, AU

USB stethoscope for diagnosing pneumonia in Mozambique

- Diagnostic sensors to be embedded in a "smart stethoscope".
- Microcontrollers to interface with healthcare workers' phones.
- TED talk as finalist for TED2013.

### UNDERGRADUATE RESEARCHER, SAIVT LAB QUT
Feb – Nov 2011 | Brisbane, AU

Brain-computer interface for actuated car simulator

- Electronic stimuli to evoke brain response; processing of brain signals to determine intent; networking & control of car steering.
- Published at AutoUI'12. Featured on SCOPE national science TV show.

### TUTOR, QUT, UTS & UNIMELB
Feb 2008 – current | Brisbane, Sydney & Melbourne, AU

Discrete maths, control systems, engineering maths, digital logic, + others. Proactively inspiring students with real-world applications.

### UNDERGRAD INTERNSHIPS (2008-2010) NICTA, AEMO, Energex

# D. Hood

## LEADERSHIP POSITIONS

| | | |
|---|---|---|
| 2021-22 | Co-Founder & Co-chair | Diversity, Equity and Inclusion at Inventia Life Science |
| 2016-18 | Organising & Program Committee | ROSCon: international ROS developer conference |
| 2016-18 | Founder & Manager | ROSCon Diversity Scholarship Program (AUD50k budget) |
| 2022 | STEM Ambassador | UTS STEMxChange education consultant to high school teachers |
| 2012 | Manager | Robogals Rural & Regional: nationwide ambassador program |
| 2009-11 | President | Industry-linked university student societies |
| 2011-13 | Course Representative | Undergraduate and postgraduate degrees |
| 2008 | Founder | QUT Women in Engineering mentoring program |

## PRESENTATIONS

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|---|---|---|
| 2012 | TED@Sydney | My Apollo 13 moment in disease diagnosis (part of the TED Talent Search) |
| 2016 | ROSCon | Overview of the internals of ROS 2 (keynote) |
| 2015 | AAAI Video Competition | A Robot That Children Can Teach to Write - The CoWriter Project (winning video) |
| 2018 | CODAME Art+Tech | Creativity in developing a robot partner for children learning handwriting |
| 2018 | SF Mini PyCon | The Python ROS interface: how does it communicate with other languages? |
| 2018 | ROSCon | Getting involved in ROS 2 development |
| 2017 | ARIAC Workshop at IROS | Behind the scenes of the simulation used for NIST's ARIAC competition |
| 2022 | Sydney Python Users | Template all the things! The python library powering robotics R&D worldwide |
| '12, '19, '22 | Power of Engineering | Altruistic applications of electrical engineering (keynote) |
| 2021 | Startmate Engineering Fellowship | The beauty (and frustration) of regulation when designing a medical device |
| 2021 | QUT AER-Con | Life as the Senior Robotics Engineer on a skin-printing robot |
| 2018 | Self-organised workshops | Making your first open source contribution |
| 2010 | QUT Engineering Week | Panel session with astronaut Andy Thomas |

## AWARDS

### Academic/Professional

| | | |
|---|---|---|
| 2022 | Engineers Australia Young Engineer of the Year | Single winner in Under 35 category, nation-wide |
| 2012 | Erasmus Mundus Postgraduate Scholarship | AUD70k value, 1 of 7 awarded worldwide for "VIBOT" MSc. |
| 2011 | QUT University Medal | Top 0.5% of graduates university-wide (for B. Maths) |
| 2011 | Engineers Australia Electrical Branch Medal | Top graduate of QUT B. Eng. (Electrical) |
| 2016 | Google Code Jam to I/O Competition | Ranked 78th world-wide |
| 2007-11 | QUT Academic Excellence Awards | All eligible semesters |

### Community Leadership

| | | |
|---|---|---|
| 2013 | Google Anita Borg Memorial Postgraduate Scholarship | EMEA region, AUD11k value |
| 2012 | Finalist for the General Sir John Monash Scholarship | Australia-wide, AUD150k value |
| 2011 | QUT Engineering John Kindler Memorial Medal | 1 of 2 graduates awarded |
| 2010 | Brightest Young Minds summit delegate | 1 of 100 selected Australia-wide |
| 2009 | Runner-up for the QLD Pride of Australia Young Leader Medal | 1 of 3 finalists state-wide |
| 2009 | QUT Student Leadership Excellence Award | 1 of 10 awarded university-wide |
| 2006 | Griffith University Logan Campus Medal | 1 awarded from Kimberley College graduates |

## PUBLICATIONS

Patent WO2021108870A1, Bioprinting system [non-contact, robot-delivered], Inventia Life Science Pty Ltd. 2019.

Lemaignan, S., Jacq, A., **Hood, D.** , Garcia, F., Paiva, A. and Dillenbourg, P., 2016. Learning by teaching a robot: The case of handwriting. *IEEE Robotics & Automation Magazine* , 23(2), pp.56-66.

**Hood, D.** , Joseph, D., Rakotonirainy, A., Sridharan, S., & Fookes, C. (2012, October). Use of brain computer interface to drive: preliminary results. *Proceedings of the 4th International Conference on Automotive User Interfaces and Interactive Vehicular Applications* (pp. 103-106). ACM.

## STRENGTHS

Reasoning, logic & algorithms (formally trained mathematician) | **Well-tested, modular software (used by safety-critical robots world-wide)** | Creative troubleshooting (test failures, system networking, and electrical circuits) | **Autonomous leadership (independently led robotics for early-stage spin-off)** | Anticipation of road-blocks & project planning (successfully coordinated projects in parallel and with large budgets) | **Intelligence/learning quickly (exceptional scholar, low time-to-contribution on large code bases)** | Attention to detail (without perfectionism) | **Agile feature management (shipped iterative prototypes with stakeholder reviews)** | Motivating teams ("joie de vivre" commonly cited on farewell cards) | **Communicating to non-engineers (experience in interdisciplinary teams)** | Empathy for end users and novice developers | **Presenting and teaching with enthusiasm (side career as a tutor/speaker)** | Humour and light-heartedness | **"The definition of a growth mindset" (according to colleagues/mentees)** | IEC 62304 & ISO 13485 training | **Mentoring**