

# Luke Cole - Curriculum Vitae

**Founder | Principal Engineer**

**Robotics, Electronics, Embedded Systems, Autonomy, AI & Product Development**

Gold Coast, Australia

[lukecole.name](http://lukecole.name) · [coletek.org](http://coletek.org) · [linkedin.com/in/lukecole](https://linkedin.com/in/lukecole) · [YouTube](https://www.youtube.com)

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## Profile

Founder and principal engineer with 25+ years of hands-on experience delivering complex robotics, autonomy, AI, embedded systems, electronics, and full-stack product development from concept through to real-world deployment and commercialisation.

Across COLETEK and earlier research and industry roles, I have led the delivery of a wide range of custom hardware and software systems, including autonomous vehicles, intelligent sensing platforms, wearable feedback systems, industrial automation, computer vision systems, edge AI products, RF/wireless systems, IoT solutions, and software platforms that unify engineering, operations, and product workflows.

I am known for combining deep technical breadth, systems thinking, and founder-level ownership to de-risk innovation, accelerate delivery, and turn ambitious ideas into practical, field-ready systems. My work has spanned startups, research organisations, and industry partners, and I am equally comfortable operating independently end-to-end, coordinating specialist contributors where required, or leading multidisciplinary collaboration. I bring a rare ability to bridge hardware, firmware, software, AI, product strategy, and commercial reality.

## Career Highlights

- Founded **COLETEK** in **2001** (formalised 2013) and built it into a multi-award-winning, founder-led Australian deep-tech product development lab.
- Led and delivered **150+ R&D / NPD projects** across robotics, electronics, embedded systems, industrial automation, AI, vision, IoT, security, and systems relevant to agriculture, marine, defence, space, medtech, environmental robotics, and cloud/web platforms.
- Contributed to the **world's first fully autonomous tractor** platform while at **Hemisphere GPS / BEELINE**. [▶ Watch Video](#)
- Delivered a **low-platform mobile robot** for transporting human dummies in simulated-city self-driving car R&D — developed for an international client within **1 month** and demonstrated within **German automotive R&D environments**. [▶ Watch Video](#)
- Co-developed **DROS** and **VisLib** during early robotics R&D years — frameworks that pre-dated the later mainstream dominance of **ROS** and **OpenCV**.
- Built advanced systems spanning **autonomous robots, edge AI vision, RF/wireless electronics, motion systems, Linux infrastructure, sensing platforms, and full-stack software**.
- Co-authored the **Robotics Roadmap for Australia** (1st and 2nd editions).
- Recognised through **2x Good Design Awards**, national media, global showcases, and endorsement from respected leaders in robotics and defence.
- Maintains a rare in-house prototyping lab enabling **lean, rapid, sovereign product development** across hardware and software.

## Selected Impact & Commercialisation Signals

- Led and delivered **150+ R&D / NPD projects** across hardware and software, spanning concept development, prototyping, testing, field deployment, and commercial-ready pathways.
- Built COLETEK into a trusted founder-led deep-tech partner for complex projects requiring unusual breadth across robotics, electronics, embedded systems, AI, sensing, and software.
- Helped clients and partners de-risk innovation by combining in-house prototyping, practical systems thinking, and rapid end-to-end execution.
- Contributed to autonomous and intelligent systems deployed or trialled in real-world agricultural, industrial, environmental, and field settings.
- Built internal platforms and workflows that improve engineering velocity, collaboration, traceability, and sovereign control over product development.
- Coordinated specialist contributors and multidisciplinary collaboration where required, while maintaining strong founder-led technical ownership.

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## Core Expertise

### Robotics, Autonomy & Intelligent Machines

- Autonomous and semi-autonomous system design
- Mobile robots, robotic platforms, smart machines, and sensor-driven systems
- ROS2, localisation, SLAM, GPS-denied navigation, path planning, safety architectures, and familiarity with PX4 / ArduPilot ecosystems
- Sensor fusion, PID and cascade control, real-time decision systems
- Practical autonomy development from prototype through field trials

### Electronics, Embedded Systems & Mechatronics

- End-to-end electronics development: architecture, schematics, PCB design, bring-up, debugging, test, and refinement
- Embedded firmware and real-time systems across MSP430, STM32, ESP32, AVR, PIC, ARM Cortex, Raspberry Pi, Jetson, and custom platforms
- Communication methods and sensor processing: I2C/SPI/UART/RS4XX, IMUs, GPS, LiDAR, Ultrasonics, IR, Radars, Cameras
- Motion control, actuation, motor systems, electro-mechanical design, and rugged field hardware
- RF/wireless, IoT, telemetry, instrumentation, and low-power systems
- Strong capability in field-deployable, safety-conscious, and commercially relevant electronics

### Computer Vision, Edge AI & Applied Machine Learning

- OpenCV, YOLO, DeepStack, TensorRT, PyTorch, TensorFlow, and edge deployment workflows
- Real-time detection, classification, tracking, targeting, and perception systems
- Dataset development, annotation, benchmarking, retraining, and production-oriented deployment
- Edge AI systems for plant recognition, hazard detection, targeting, and monitoring
- Practical AI integration into real products, not just lab demos

### Linux, Full-Stack Platforms & Technical Infrastructure

- Linux systems engineering across embedded, desktop, and server environments
- Docker, systemd, MQTT, WebRTC, MariaDB/MySQL, Node.js, Bash, Python, C/C++, and web stacks
- Full-stack product and collaboration platforms unifying documentation, project flow, communications, telemetry, media, and AI tasks
- Cybersecurity-aware architecture, hardened systems, toolchains, CI-style automation, Python-based AI agents using local/offline LLMs or third-party APIs, and DevOps-minded deployment
- Sovereign and edge-oriented thinking across infrastructure and product strategy

### Leadership, Strategy & Ways of Working

- Founder-led technical leadership with strong ownership and execution
- Equally effective as an independent principal engineer, R&D lead, product architect, or senior technical collaborator
- Comfortable leading multidisciplinary teams while also driving difficult work independently end-to-end
- Strong at bridging technology, commercial realities, product vision, and mission-driven outcomes
- Suited to principal engineering, technical founder, advisory, board, and innovation leadership contexts

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## Professional Experience

### Founder / Principal Engineer — COLETEK

2001–Present

Founded in 2001, formalised as a company in 2013

Multi-award-winning Australian product development lab specialising in robotics, embedded systems, AI, software, autonomy, and lean R&D to commercialisation.

- Founded and built **COLETEK** as a multidisciplinary deep-tech product development lab helping clients and partners de-risk innovation and turn ambitious ideas into working systems.
- Led and delivered **150+ real-world product builds and R&D projects** across hardware and software, ranging from early proof-of-concept through to field-tested and commercial-ready systems.
- Designed and delivered systems spanning **autonomy, AI, robotics, sensing, industrial automation, motion control, RF/wireless, cloud/web platforms, and embedded electronics**.
- Built a reputation as a trusted behind-the-scenes technical partner for inventions, prototypes, and deep-tech product development that later entered market, field trial, or commercial pathways.
- Combined deep autonomy and founder-level accountability with the ability to align clients, suppliers, engineers, researchers, and commercial stakeholders around delivery.

### Selected Platforms, Projects & Capability Areas

- **COLETEK.IO** — Architected and built an in-house product development, operations, and collaboration platform integrating project workflows, versioned engineering assets, documentation, communications, live video, remote support, AI tasks, data flows, and internal business tooling.
- **Clean Earth Bot** — Leading development of an environmental robotics platform focused on manure collection, land care, nutrient cycling, and broader environmental automation pathways, alongside commercial traction in related biogas systems.
- **AI Smart Rider** — Leading development of a wearable equestrian technology platform combining sensing, haptics, feedback systems, AI, and rider performance/safety insights.
- **Scotty Robot** — Long-running modular robotics platform used as an internal R&D testbed across sensing, mobility, autonomy, AI, and future edge-companion system concepts.
- **Autonomous Quad Bike & Lawnmower** — Developed autonomy stack elements including navigation, safety layers, sensing integration, and path-planning-related capabilities.
- **Low-Platform Mobile Robot** — Delivered a mobile robot for transporting human dummies in simulated-city self-driving car R&D, developed for an international client within 1 month and demonstrated within German automotive R&D environments.
- **Plant Species Recognition System** — Built a high-performance edge AI / computer vision system for in-field agricultural plant identification, achieving >99% classification accuracy for a client deployment and designed for retraining into adjacent recognition tasks.
- **AI Hazard / Smart Sign Platform** — Developed a modular intelligent road-sign concept combining radar, vision, lux/environmental sensing, wireless comms, and edge AI for real-time hazard detection. Showcased at **AFAC24**.
- **AI Gimbal Targeting System** — Developed a real-time computer vision targeting platform for live field trials involving feral dog detection, tracking, and deterrent payload aiming.
- **Factory Automation Systems** — Designed and built bespoke electromechanical systems for industrial clients involving custom mechanisms, motion control, sensors, machine logic, enclosure design, and real-world operational robustness.
- **Road Safety, Monitoring & Intelligent Sensing Systems** — Contributed to and architected multiple projects spanning speed awareness, hazard detection, sensing, telemetry, and embedded monitoring systems.
- **AgTech & Environmental Systems** — Developed and reviewed systems across agriculture, land care, conservation, environmental monitoring, and intelligent field instrumentation.
- **Marine / Remote / Instrumentation-Oriented Systems** — Worked across ruggedised sensing, telemetry, specialist electronics, and safety-conscious designs relevant to harsh or constrained environments.
- **Marketplace & Platform Architecture** — Built and evolved e-commerce and internal platform systems well before the current SaaS and marketplace boom, including early online marketplace work and later broader platform architecture under the COLETEK umbrella.
- **Early Linux / Open Hardware Tools** — Built Linux tools and device interfaces in the 2000s, including a parallel-port PWM driver, PIC programmer, and USB Missile Launcher driver, with work featured in *Make Magazine* and *Hak5*.

## Strategic Consulting / Environmental Systems Reviews

Conducted high-level technical and ecological systems reviews commissioned by philanthropist and tech founder **Graeme Wood**, including:

- black rat removal strategy on Lord Howe Island
- prickly acacia control in Western Australia
- sea urchin overpopulation analysis and intervention concepts
- water conservation strategies for remote Australia

These engagements focused on technical feasibility, systems design, ecological realities, and scalable automation/robotics opportunities for meaningful long-term impact.

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## Robotics Engineer — Hemisphere GPS (formerly BEELINE)

2009-2012

- Contributed to the development of the **world's first fully autonomous tractor** platform, including steering, hitch control, geofencing, autonomous manoeuvres, and the "One Touch" user experience. [▶ Watch Video](#)
  - Developed visual localisation fallback capability for periods of degraded or lost RTK GPS.
  - Helped develop one of the early electric steering-wheel controller systems for autonomous agricultural machinery.
  - Worked in a high-pressure commercial R&D environment where robust delivery and rapid problem solving mattered.
  - Contributed to autonomy systems that bridged research-grade ideas and real-world agricultural deployment.
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## Robotics R&D — NICTA / CSIRO Data61

2004-2008

- Created **InsectBot**, a 3DOF fish-eye stereo vision robot used for UAV simulation, haptics, and robotics research.
  - Invented the **Active Mirror Vision System** for localisation and perception research.
  - Co-developed **DROS**, a modular robotics operating framework created before ROS became the dominant standard.
  - Co-developed **VisLib**, a computer vision framework developed before OpenCV became the prevailing library in many labs.
  - Designed and produced custom multi-PCB panels and supporting electronics for sensors, motors, machine vision systems, and robotics experiments.
  - Became known as a highly capable hardware and systems person within an advanced robotics research setting.
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## Other Technical Roles

### Seeing Machines

- Worked on hardware integration relating to face and eye tracking systems and human-machine interface development.

### CSIRO ICT

- Co-developed the video-conferencing **AirHockey table** demonstrated at CeBIT.

### Location Aware Technology

- Built RF-based indoor positioning systems and related localisation concepts.

### KTH Royal Institute of Technology (Sweden)

- Delivered a rapid speech-recognition prototype within 1.5 weeks.

### ANU RISE — Robotic Systems Lab

- Long-term early contributor across smart cars, submersibles, indoor robots, drones and related systems from age 17, working alongside leading robotics researchers during formative years.

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## Awards, Recognition & National Contribution

-  **2x Good Design Awards** — recognised for innovative, practical product design
-  Publicly endorsed by **Prof. Alex Zelinsky AO FAA FTSE FRSN**, who described Luke as: *“an outstanding young Australian and entrepreneur who I had the privilege to mentor.”*
-  Invited to the **Gold Coast Industry Leaders Roundtable**
-  **Co-author** — *Robotics Roadmap for Australia* (1st & 2nd editions)
-  Hosted, visited by, or engaged with organisations including **Silicon Valley Robotics, The Robotics Hub, Robotics Australia Group / Australian Robotics Network, Tritium, City of Gold Coast, AFPA, Department of Agriculture and Fisheries (QLD)**, and others
-  Work and products featured through media, demonstrations, conferences, and public showcases in Australia and internationally
-  COLETEK recognised by **APAC CIO Outlook** as one of the **25 Most Promising Robotics & Automation Tech Solution Companies (2016)**

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## Publicity, Events & Media

COLETEK and associated work have been featured across a broad mix of industry, media, expo, and demonstration contexts, including:

- **Google Sydney HQ** — roundtable / think tank participation
- **AFAC24** — AI-powered fire / hazard technology showcase
- **Consumer Electronics Show (CES)** — wellness / product showcase involvement
- **Land Forces Defence Expo** and **DSEI** — defence-adjacent showcase contexts
- **Breeders' Cup** and **Kentucky Derby** — equestrian technology exposure
- National and international media including **Today Show, 7 News, 9 News, WDRB, HackSmith, Hak5, Make Magazine**, and others

This blend of exposure reflects a career that has consistently sat where **deep tech, practical product development, and public imagination intersect.**

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## Selected Publications

### Thesis

- *Luke Cole, Localisation using Active Mirror Vision System, ANU, 2005*

### Conference Papers

- *Insect Inspired 3D Centring* — Cole, Barnes, ACRA 2008
- *Virtual Force Feedback InsectBot* — Schill, Mahony, Corke, Cole, ACRA 2008
- *Insect Inspired Robots* — Lim, McCarthy, Shaw, Barnes, Cole, ACRA 2006
- *AirHockey Over a Distance* — Mueller, Cole et al., ACE 2006
- *Template Matching for Object Recognition* — Cole, Austin, Cole, ACRA 2004






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## Education

- **Bachelor of Engineering (Mechatronics, Honours)** — Australian National University, 2008
- **Bachelor of Information Technology (Software Development)** — Australian National University, 2006

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## Early Distinctions

-  **2nd in NSW HSC Advanced Maths** (behind Geordie Williamson, Youngest living Fellow of the Royal Society) - Chevalier College, Bowral, 1999
-  **Young Scientist Award for Robotics** — sponsored by *The Sydney Morning Herald* and the Powerhouse Museum, 1997
-  **Sergeant, Australian Army Cadets** — rapidly promoted; led Three Platoon and earned top honours in marksmanship and bushcraft
-  Built early mobile robots and electronics systems in youth, laying the foundation for a lifelong robotics path
-  Also achieved strongly in sport and competition during youth, reflecting a long-standing drive toward discipline, performance, and execution

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## Technical Environment

Maintains a well-equipped hardware prototyping lab supporting both local and remote product development, including:

- electronics assembly and rework capability
- reflow and soldering systems
- oscilloscopes, analysers, test gear, and instrumentation
- mechanical tools, fabrication capability, CNC, and 3D printing
- practical prototype bring-up, failure analysis, debugging, and refinement workflows

This environment supports a lean, hands-on, founder-led style of development where ideas can move rapidly from architecture to real hardware and tested systems.

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## Philosophy

### COLETEK's philosophy is simple:

- **Sovereign** — self-owned, secure, and built for long-term control
- **Lean** — cost-aware, practical, and paced for purpose, not hype
- **Meaningful** — focused on real impact, not vanity innovation

I do not chase trends for the sake of trendiness. I care about building things that matter — systems that are technically strong, commercially grounded, and capable of doing real work in the world.

*“Robotics is more than engineering — it’s a mirror for life.  
The more we understand nature, the better we design machines.  
The more we build, the more we uncover about ourselves.”*  
— **Luke Cole**

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## Roots & Beliefs

Raised between the **Southern Highlands** and **Wollongong**, NSW, in a family of makers, mechanics, and practical problem-solvers, I was exposed early to machining, electronics, computers, tools, and the mindset that things can be understood — and built.

COLETEK began long before it was a formal company. It started with curiosity, salvaged parts, handmade robots, and a deep fascination with how sensing, control, and intelligence can come together in physical systems.

Over time that became more than a technical path. It became a way of seeing the world:

- understand first principles
- respect real-world constraints
- build carefully and honestly
- stay mission-driven
- use engineering as a force for meaningful progress

COLETEK is the continuation of that legacy — where love of craft, technical depth, and long-term systems thinking meet.

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## Selected Mentors, References & Endorsements

*Selected references shown here are long-standing mentors, collaborators, or respected leaders familiar with Luke's work, character, and technical capabilities.*

### **Prof. Alex Zelinsky AO FAA FTSE FRSN**

Vice-Chancellor and President, University of Newcastle  
Former Chief Defence Scientist of Australia  
Former Director of CSIRO  
Co-Founder, Seeing Machines

### **Dr. Sue Keay**

Director, UNSW AI Institute  
Founder and Chair, Robotics Australia Group  
Former Adjunct Professor, QUT Centre for Robotics

### **Dr. David Austin**

Director, Madj Innovations  
Former ANU / NICTA Robotics Supervisor  
University Dux, PhD in Robotics

### **Dr. David Reeves**

Multidisciplinary Systems & Electronics Expert  
Former Professor of Chemistry / Systems Engineer, Hemisphere GPS

Additional references available by request.

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## Advisory, Board & Leadership Scope

Open to select discussions relating to:

- principal engineering, CTO-track, and senior technical leadership roles
  - advisory and board roles in deep-tech, robotics, autonomy, AI, embedded systems, and sovereign capability
  - strategic product and technology direction
  - innovation governance, technical due diligence, and complex systems risk evaluation
  - scaling R&D into robust, commercially viable products and platforms
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## Let's Build the Future

If you are solving something difficult, building something meaningful, or looking for rare breadth across **robotics, autonomy, electronics, embedded systems, edge AI, Linux, sensing, full-stack platforms, and lean R&D**, I would be glad to connect.

I am open to collaboration and leadership discussions across:

- advanced product development and applied R&D
- robotics, autonomy, sensing, and intelligent machines
- embedded systems, electronics, edge AI, and full-stack technical platforms
- sovereign technology, mission-driven ventures, and innovation leadership
- principal engineering, advisory, board, and strategic technical roles

**Great things take time — but they still need to be built.**