

# GIDEON KOWADLO, PHD, BENG (HONS), BSC

*Research and Development \* Algorithms \* Computer Vision \* Image Processing  
Biotechnology \* Software Engineering \* Robotics*

Phone: +61-(0)402-77-55-42  
Melbourne, Australia

Web site: <http://gideon.kowadlo.net>  
Email: [gkowadlo@gmail.com](mailto:gkowadlo@gmail.com)

---

Gideon has over 8 years of research experience in varied fields of computer science, computer vision, engineering and biotechnology. He has the ability to draw on this experience to offer an innovative and multidisciplinary approach.

## EDUCATION

- Ph.D., Monash University, Australia** 2002 – 2006  
Department of Electronics and Computer Systems Engineering.  
PhD topic: *Robot Odour Localisation in Enclosed and Cluttered Environments Using Naïve Physics.*
- Bachelor of Engineering (First Class Honours), Monash University, Australia** 1996–2001  
Electrical and Computer Systems Engineering (Biomedical Engineering Major)
- Bachelor of Science - Monash University, Australia** 1996–1998  
Physiology major (neuroscience unit)

### University Awards

- Recipient of the 'Australia Israel Scientific Exchange Foundation' Fellowship (2005).
- Silicon Graphics International Award for most technically proficient final year project (2001).
- Science Faculty Deans list scholar (1997, 1999).
- Mathematics Special Projects Member (1997).

## PROFESSIONAL EXPERIENCE

- Senior Algorithm Developer, SportVU Israel** Jun 2007-Feb 2009  
Conducted R&D projects for soccer player tracking, including:
- Camera calibration (optimisation), and interfacing (hardware, software),
  - Development and implementation of computer vision algorithms for advanced scene analysis, including segmentation, histogram analysis, colour space transformations and other techniques.
  - Research, planning and implementation of heuristic and Bayesian multiple target tracking algorithms.
  - Conducted training sessions in Africa, England, USA, Germany and Israel.
- Mechatronic Product Development** 2007  
Developed several consumer mechatronic novelty items / toys.
- Self-employed, worked in collaboration with Buzz Creative Product Agency ( <http://buzzproducts.com> ).
- Molecular Modelling Researcher, Ludwig Institute for Cancer Research, Australia** 1998-2002, 2006  
*Ludwig Institute for Cancer Research, Melbourne, Australia.*
- Analysed a class of a protein tertiary structure named the  $\beta$ -Helix, and identified common structural elements (from mathematical to primary (amino acid) sequence).
  - Designed a family of synthetic  $\beta$ -Helices (development of a novel procedure of *de novo* protein design).
- Laboratory Demonstrator, Monash University, Australia** 2001-2005
- Demonstrating and teaching principles during laboratory sessions for a variety of undergraduate subjects.
- Robotics Researcher, Monash University, Australia** Jan-Feb, 2001
- Designed and constructed rangefinder apparatus (using a SICK laser rangefinder and actuated gimbal) to create a map of the environment.
  - Programmed control of gimbal data acquisition and map building.
- Access Database Development** 1996-2001
- Design and implementation of databases (including GUI, SQL and VBA scripts) for several organisations: Hagshama department, King David School, Numerix, and the Ludwig Institute for Cancer Research.

## ACADEMIC RESEARCH EXPERIENCE

**Computer Vision Visiting Student, Dept. Info. Electronics, Nagoya University, Japan** Jan – Feb 2007

- Wrote detailed technical documentation for a 100 camera/microphone system that is used to generate a dynamic captured scene from arbitrary viewpoints.

**Robotics Ph.D., Dept. Elec. and Computer Systems, Monash University, Australia** 2002 – 2006

See <http://gideon.kowadlo.net/thesiscontributions.html> for the main contributions.

- Studied and characterised airflow in enclosed environments.
- Developed ‘Naïve Physics’ algorithms for modelling the airflow without the use of conventional CFD (faster and more appropriate for commonsense reasoning).
- Developed algorithms for locating an odour source using an airflow map and multiple sensors.
- Developed a framework that exploited statistical techniques to improve the ‘naïve’ airflow map with noisy sensors.
- Built and programmed a robot, from low level control to high level reasoning.

**Human Motor Control / Robotics Visiting Research Student, Weizmann Inst., Israel** Jan – Apr 2005

- Developed a mathematical model for predicting inertia of the hand and object during grasping tasks, and implemented it in Matlab.
- Tested the predicted inertia by taking measurements using human subjects and optical markers, involving data conditioning (de noising, curve fitting) and parameter estimation (using constrained optimisation).

## RELEVANT SKILLS

### Programming

- C / C++ (over 5 years experience), Objective C, Matlab, Mathematica, Assembly and Perl scripting,
- OpenCV, OpenMP, SSE, STL,
- Object oriented and real-time systems,
- Unix and Windows based operating systems,
- Microsoft Access database development using SQL and VBA.

### General Computing and Electronics

Extensive experience with computer systems hardware and software including:

- methods for artificial intelligence,
- machine learning, multivariate statistical analysis,
- analog and digital signal processing (DSP),
- optimisation,
- camera calibration, interfacing and synchronisation,
- image processing and computer vision techniques,
- mapping and localisation techniques (robotics),
- low-level programming (assembly and C/C++) of microcontrollers (Motorola HC11, Renesas M16C, Infineon c167 and others) for PWN, real-time interrupts, A/D conversion etc.,
- analogue and digital circuit design for electronics systems including power supplies, sensors, actuators and other general electronics, and
- use of multiple sensing and actuation modalities,
- graphic design with both image and vector based packages.

### Others

- Skills for conducting biomechanics experiments, and for molecular modelling.

## PUBLICATIONS

Research outcomes include 12 publications covering mobile robotics, human motor control and protein modelling:

- 4 ISI International Journals,
- 3 IEEE international peer reviewed conference papers,
- 4 peer reviewed Australasian conference papers, and
- 1 technical report.

To refer to publications (pdf's and abstracts), please visit <http://gideon.kowadlo.net/publications.html>.

## COMMUNITY INVOLVEMENT

### **Engineers Without Borders**

I was one of 8 young adults that established Engineers Without Borders Australia (<http://www.ewb-aus.org.au/>), a not for profit organisation “that works both within Australia and abroad to improve the knowledge and physical resources of people in need.” This process began in late 2002, and by April 2003, the organisation was officially registered. I was a member of the board of directors until mid 2004.

Currently the organisation is involved in local and international development projects, and membership continues to rise to the hundreds.

In late 2003, I initiated the creation of an executive, and together we began Engineers Without Border - Monash University chapter, which is also enjoying increasing popularity and success.

### **Youth Leader**

I was a volunteer youth leader for 3 years, facilitating camps and weekend activities with educational as well as recreational components.

**References, publications and academic statements available on request.**