

# OSCAR TIN YIU LAI

Australian Citizen

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## PERSONAL STATEMENT

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I am an enthusiastic individual who persuades to exceed expectations. Collaboration and working as a team always help me to think in a new angle. I am interested in solving complex challenges while developing an elegant solution and algorithm. The world of abstract thinking brings the beauty of simplicity. To me, engineering is about simplifying complexity.

## EDUCATION

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**University of Sydney**, Camperdown, NSW 2006 Mar 2018 – Present

Doctor of Philosophy *in Engineering & Information Technologies*

- ▷ Research interests: Machine learning in field Robotics on Reinforcement Learning
- ▷ The aim is to develop reinforcement learning (RL) agent that can learn policies directly from high-dimensional sensory inputs, and makes value judgement based on both spatial and temporal scale by estimating total rewards that an agent can expected with minimal human interference.

**University of Sydney**, Camperdown, NSW 2006 Mar 2013 – Nov 2017

B. Civil Engineering *in Structural* & B. Science *in Computer Science (Honours Class I)*

- ▷ Civil Engineering specialised in Structural, core studies included:
  - Steel Structural Behaviour      - Geotechnical Techniques      - Fluid Behaviour
  - Reinforce Concrete Design      - Site Surveying      - Project Management
- ▷ Computer Science major core studies included:
  - Algorithm Complexity & Development      - Language / Compiler Implementation
  - Object-Oriented Software Design      - Artificial Intelligence

**Cherrybrook Technology High School**, Cherrybrook, NSW 2126 Jan 2006 – Dec 2012

HSC Subjects in:      - English      - Engineering      - Mathematics      - Mathematics Ext.1  
                             - Japanese      - Chemistry      - Physics

- ▷ First in school in *Mathematics, Engineering*.
- ▷ HSC Band 6/E4 in *Mathematics, Mathematics Extension 1, Engineering, Japanese*

## WORK & EXPERIENCE

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**University of Sydney Library** Aug 2018 – Present  
*Peer Learning Advisor* Sydney, Australia

- Provide roving peer to peer support to students from a range of disciplines
- Facilitate workshops, services, forums and online communities to engage and help students
- Prompt innovation technology, e.g., 3D printer, digital carving machine, recording studio, and VR

**National Institute of Informatics** Jan 2019 – Mar 2019  
*Invited Researcher* Tokyo, Japan

- Invited to an Unmanned aircraft system Traffic Management (UTM) lab to work on a deep learning based computer vision model, designed for drone-assisted applications like search & rescue or surveillance
- Developed a working prototype that can perform simultaneous human detection and activity recognition real-time using only the onboard camera and processing power

**University of Sydney – ITAS** Apr 2016 – Oct 2018 (Seasonal)  
*Indigenous Tutorial Assistance Scheme Tutor* Sydney, Australia

- Helped indigenous students whose in Indigenous Tutorial Assistance Scheme (ITAS)—an academic initiative of the Commonwealth Government’s tutorial support scheme
- Provided academic supports for their understanding of academic concepts, assignments and exams
- Rehired throughout different semesters (*Apr – Jul 2016; May – Jul 2017; Apr – Oct 2018*)

### **AECOM**

Dec 2016 – Feb 2017

*Internship - Geotechnical Intern*

*138 Shatin Rural Committee Road, Hong Kong*

- Worked in a geo team that mainly focus on ELS (Excavation Lateral Support) and site monitoring
- Tasks included checking force balance/rotational moments within struts, designing different stages within an excavation, providing temporary work for structural support
- Scheduled laboratory triaxial test of on-site drillholes, to obtain soil properties and site profile
- Used PLAXIS to obtain diaphragm walls forces, and SLOP/W & SEEP/W for modelling soil behaviour
- Involved in projects such as HK Metro Station Excavation, HK Airport Sub-sea Tunnel monitoring, etc.

### **Meinhardt (C&S), Hong Kong Limited**

Dec 2015 – Feb 2016

*Internship - Structural Team Trainee*

*33-35 Wong Chuk Hang Rd, Hong Kong*

- Tasks includes modifying amendments for building department submission, updating CAD files of drafting, modelling collision impacts, verifying building standards calculations via ETABS & SAFE
- Worked as a group to check calculation of safety measure, e.g., connections and member capacity checking
- Created 3D models of structural interior or temporary work via software like Sketchup and Navisworks
- Involved in projects such as Ocean Park stadium tender, Boiler upgrades, HK airport hangar design

### **University of Sydney – Club & Societies**

Mar 2013 – Nov 2017

*Voluntary uni club executive*

*Sydney, Australia*

- Organised, planned, and led social activities for uni students to facilitate student engagement
- Supervised and held general meeting and AGM with other club executives
- Communicated with uni coordinators, speakers, professors whenever needed

### **Cherrybrook Technology High School**

Nov 2012 – Aug 2013

*Private tutor*

*Sydney, Australia*

- Provided private tutoring twice a week to high school students on Maths & Physics
- Developed lessons and activities to teach students with improved study skills and test scores

## **AWARDS & SCHOLARSHIPS**

### **University of Sydney Postgraduate Awards (UPA)**

Mar 2018

*Scholarships Office*

*University of Sydney*

- Designed to assist with general living costs and are awarded to students of exceptional research potential to undertake a higher degree by research at the university

### **Research Training Program (RTP) Scholarships**

Mar 2018

*Department of Education and Training*

*Australia Government*

- Provides block grants to support both domestic and overseas students undertaking Research Doctorate and Research Masters degrees

### **University of Sydney Honour Roll**

2017

*2017 University of Sydney Honour Roll*

*University of Sydney*

- Awarded to students of distinction through the conferral of graduates honours from the Faculty of Engineering and Information Technologies

## School of Information Technologies High Honour Roll

*School of IT 2016 Awards Ceremony*

Apr 2016

*University of Sydney*

- Awarded to individuals with distinguish results in IT unit of studies in 2015

## School of Civil Engineering Paddle Pop Stick Bridge Competition

*School of Civil Eng. : Intro. to Eng. Disciplines (ENGG1800)*

Jun 2014

*University of Sydney*

- Competition joint sponsored by *Robert Bird Group* and *Talis Civil Pty Ltd*, on designing and building a paddle pop stick bridge that has maximum structural efficiency (best strength-to-mass ratio)
- Won cash-prize: 2<sup>nd</sup> Prize \$450 (overall) + Best on Afternoon \$100 (class division)

## Distinguished Achievers Award

*2012 Higher School Certificate (HSC)*

2012

*Board of Studies, NSW Australia*

- Certificates for *Distinguish Achievement* (highest level of performance) in HSC: awarded for *Mathematics*, *Mathematics Extension 1*, *Engineering Studies*, and *Japanese Beginners*

## High School Academic Award

*Year 12 Academic Award Ceremony*

2012

*Cherrybrook Technology High School*

- Academic Awards for ranking 1<sup>st</sup> in *Mathematics*, and *Engineering Studies* in the entire school

## PUBLICATIONS

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Tin Lai, Fabio Ramos, and Gilad Francis. Balancing global exploration and local-connectivity exploitation with rapidly-exploring random disjointed-trees. In *Proceedings of The International Conference on Robotics and Automation (ICRA)*. IEEE, 2019 [[arXiv](#), [video](#)]

F. Tahmasebinia, M. Niemelä, S.M. Ebrahimzadeh Sepasgozar, T.Y. Lai, W. Su, K.R. Reddy, S. Shirowzhan, S. Sepasgozar, and F.A. Marroquin. Three-dimensional printing using recycled high-density polyethylene: Technological challenges and future directions for construction. *Buildings*, 8(11), 2018 [[article](#)]

Tin Lai. Numerical modelling of structural behaviour of continuously reinforced concrete pavement. Bachelor's Honours Thesis, Oct 2017 [[engrXiv](#)]

## PERSONAL STRENGTHS

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### Key Skills

Critical thinking in approaching challenges  
Quick adaptation in unseen environment  
Visualise complex problem w/ abstract thinking

### Language

Bilingual in *English*, *Cantonese*  
Basic in *Mandarin*, *Japanese*

## TECHNICAL STRENGTHS

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### Computer Languages

C/C++, Java, Python, Go, L<sup>A</sup>T<sub>E</sub>X, PostgreSQL, HTML, PHP, jQuery, JavaScript, CoffeeScript, MATLAB, R, VBA, Shell Scripts, Processing, Lisp, Haskell, ProLog, ANTLR4

### Professional Applications

AutoCAD, MatLab, Google Sketchup, Weka, Strand7, Abaqus FEA, RAPT, ETAB, SAFE, PLAXIS, SLOP/W, SEEP/W, Navisworks

### General Software & Tools

Microsoft Office suite, iWork, Adobe Photoshop, Illustrator

### Operating Systems

Linux variants, MacOS X, Windows, ROS

### Miscellaneous

Software configuration management, strong verbal and written communication skills, excellent troubleshooting and debugging skills, exceptional problem solving skills