

Krisada Chaiyasarn

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Education

- 2007–2013 **PhD**, *University of Cambridge*.
Civil and Information Engineering
- 2003–2007 **BA/MA/MEng**, *University of Cambridge, Merit*.
Structural, Environmental and Geotechnical Engineering
- 2001–2003 **A-level**, *Cambridge Centre for Sixth-form Studies*.
Maths (A), Further Maths (A), Physics (A), all high 90%, Advanced Extension Physics (Merit) and Mathematics (Merit)
- 1995–2001 **Mathayom 6**, *Sisaket Wittayalai School, Thailand, 3.94/4.00*.

PhD thesis

- Title *Damage Detection and Monitoring for Tunnel Inspection based on Computer Vision*
- Supervisors Prof. Kenichi Soga and Prof. Roberto Cipolla
- Description An automated image processing system was developed and implemented in Matlab and C++ using open source libraries (OpenCV) to detect and monitor anomalies that are visible on the tunnel surface due to ageing infrastructure. The research proved the advantages of the developed system over the costly traditional inspection methods and identified the flaws and drawbacks of the system. A new mosaicing technique was developed to create a large and almost distortion-free mosaic of tunnel images using Support Vector Machine and Multi-View reconstruction from uncalibrated images. A new technique in feature matching was also developed using an unsupervised learning algorithm (e.g. Random Forest) to improve feature matching algorithms, which are fundamental in most Computer Vision tasks. Lastly, an algorithm, which can detect changes of anomalies on the tunnel surface from multi-temporal images, was also developed and was achieved by applying accurate photometric and geometric registration algorithms. The research led to further collaboration with Toshiba and ITMSoils.

Master thesis

- Title *Optical Fibre Distributed Strain Measurements (BOTDR) of Reinforced Concrete Column*
- Supervisors Prof. Kenichi Soga

Description Different types of installation techniques of BOTDR, an optical sensing technology capable of monitoring strain profiles for large-scale structures, were investigated in reinforced concrete columns. The results from BOTDR were compared against traditional instruments commonly used for strain measurements. It was concluded that BOTDR offers many benefits over traditional instruments.

Research Interest

Automated Inspection, Nondestructive Evaluation, Smart Sensing, Structural Health Monitoring, Computer vision, Image Processing, Inspection, Pattern Recognition, Machine Learning, Data Mining, Finite Element, Water Management, Climate Change

Scholarship and Awards

- 2007–2011 **Engineering and Physical Sciences Research Council, Christ's College, Cambridge Overseas Trusts.**
Full scholarship covering tuition fees and maintenance allowance for PhD study
- 2011 **Toshiba Research Scholarship.**
- 2011 **Lundgren Scholarship.**
- 2010 **International Computer Vision Summer School**, Reading group prize-winner.
- 2003–2007 **Royal Thai Government**, Full scholarship for Undergraduate and A-level studies.
- 2006 **Cambridge University Engineering Department**, Computing Project Prize-winner in revenue optimisation.
- 2005 **Cambridge University Engineering Department**, Language Prize in Spanish.
- 2002 **UK Senior Mathematical Challenge**, Gold medal.
- 2001 **Physics Olympiad**, top 50 students nation-wide.
- 2001 **LG senior student challenge**, 2nd place.

Teaching and Demonstration

Key Teaching Areas.

Water Engineering, Finite Element, Photogrammetry, Image Processing, Computing, Machine Learning, Structures

- 2014–Present **Thammasat University, Department of Civil Engineering, Lecturer.**
- *Lecturer*—Currently design, teach and plan a core module *Statics* to 2nd year students and an elective module *Computing for Engineers* to 3rd and 4th students.
 - *Demonstrator*—Currently supervise Soil Mechanics and Highway Engineering labs.
- 2007–2011 **Cambridge University Engineering Department.**
- *Co-supervisor*—Initiated, planned and mentored a Masters dissertation for 12 months, resulting in dissertation awarded 1st class (78%), Title: *Change detection of cracks based on computer vision.*
 - *Supervisor*—Water Engineering and Finite Element Method for third year students.
 - *Demonstrator*—C++ laboratory work for 1st and 2nd year students
- 1999–2011 **Private Tutor**, Mathematics, English and Physics.

2001—2003 **Volunteer Tutor**, Mathematics, English and Physics.
Helped students in Sisaket in preparation for the national entrance examination

Publications

K. Chaiyasarn, TK. Kim, F. Viola, R. Cipolla and K. Soga, Distortion-free image mosaicing for tunnel inspection based on robust cylindrical surface estimation via structure from motion , *Computing in Civil Engineering*, in review

K. Soga, K. Chaiyasarn, F. Viola, J. Yan, A. Seshia and R. Cipolla, Innovation in monitoring technologies for underground structures, *International Conference on Information Technology in Geo-Engineering*, Shanghai, IOS Press, pp. 3-18, 2010.

K. Chaiyasarn, TK. Kim, F. Viola, R. Cipolla and K. Soga, Image Mosaicing Via Quadric Surface Estimation with Priors for Tunnel Inspection, *International Conference on Image Processing*, 2009

K. Chaiyasarn, Crack Detection from Automatic Image Registration of Tunnel Images, Technical Report, Department of Engineering, University of Cambridge, 2008

Administrative Positions

Jan 2015 - Present Assistant Dean in Special Affairs

Dec 2014 - Present Assistant to Department Head in Information Technology and Website

Invited Talk and Presentation

01/2012 Samaggi Academic Networking Event, Cardiff, Wales

12/2011 NSF Workshop for developing new international collaborations in underground infrastructure, Cambridge, UK

05/2011 BGA Monitoring and Instrumentation Symposium, London, UK

03/2011 Geotechnical Research Seminar, Cambridge, UK

11/2009 International Conference on Image Processing, Cairo, Egypt

06/2009 Geotechnical and Geo-environmental Research Group Workshop, Cambridge, UK

06/2008 Geotechnical and Geo-environmental Research Group Workshop, Cambridge, UK

Refereed

Journal of Zhejiang University Science C (Computers and Electronics)

Work Experience

12/2014– Present **Lecturer**, *Thammasat University*, Department of Civil Engineering.

- Design, plan and teach two subjects, Statics and Computing for Engineers
- Supervise and mentor two lab demos, Soil Mechanics and Highway Engineering
- Co-supervise 1 PhD student

- 09/2013– **Electronic Market Making Developer**, *J.P.Morgan*, London.
 07/2014
- Co-ordinated, gathered requirement, business analysis for EMM - a fully automated low latency Market Market system for Futures and Options and ETF
 - Developed new features for EMM based on business requirements
 - Analysed trading data to discover latent variables impacting short term prices of ETF
- 07/2012– **Intern**, *J.P.Morgan*, London.
 06/2013
- Co-ordinated, gathered requirement, business analysis, and implementation for EdgE - Equities, Futures & ETF Trade Order Management System, Custom Basket Pricing & Price Publication & low latency Basis Trading.
 - Organised and maintained regular meetings between the business and technologists. Performed application testing
- 08/2011– **Consultant**, *Belgium Government, Ministry of Mobility and Public Works*, Brussels.
 01/2012
- Advised and worked closely with senior government officials to develop an image-based monitoring system on embankment.
 - Designed and implemented an innovative system offering 200% cost-savings over a traditional method.
- 07/2006– **Intern**, *Cambridge Environmental Research Consultant*, Cambridge.
 09/2006
- Analysed and extracted technical data to model the dispersion of air pollution using company in-house software.
 - Performed validation on key datasets by statistical analysis using regression analysis.
 - Modified a technical modelling process by establishing a framework, used as a benchmark by the clients.
- 07/2005– **Assistant Researcher**, *Cambridge University Engineering Department*, Cambridge.
 09/2005
- Created and applied a Fortran simulation to investigate the effects of dislocation in micro-scaled materials.
 - Collaborated with post-doctoral researchers for publication and created a reference manual of the simulation code.
- 06/2004– **Engineering Data Analyst**, *Phusis LTD./ Rolls-Royce*, London.
 09/2004
- Identified strategies to improve supply chain efficiency, resulting in cost-savings in excess of £10M for clients.
 - Worked in a team of 8 to create an electronic database of mechanical parts and suppliers in the supply chain.

Languages

English **Fluent**
 Thai **Native**

Computer skills

Programming C++, Python, MATLAB, Java, SQL, C#, Javascript, Fortran, Octave, Shell and Perl scripts
 Software ADMS, Excel, Powerpoint, Word, Latex
 OS Mac Os X, Windows, Linux

Activities

2004–2012 **Cambridge University Thai Society.**
 Roles: Director, Creative Director, MC, Publicity Officer

- 2011 **Startup Weekend, Amsterdam.**
Collaborated in a team of 5 to launch a food social media website during an intensive entrepreneur workshop. Pitched ideas to leading venture capitalists and entrepreneurs (> 200 delegates).
- 2011 **Cambridge University iTEAMS.**
Conducted a market research and developed potential contacts using cold-calling and networking for a new image fusion technology
- 2011 **Cambridge University Finance and Investment Club.**
Analysed and select stocks in the technology sector
- 2004–2005 **Cambridge University Engineering Department.**
2nd year student representative

Interests

- Dancesport Representing the Cambridge University Dancesport Team to win 3 times in the national champion and 4 times in the Varsity during 2006–2011
- Makeup Amateur makeup artists to help in various occasions
- Choreography Choreographed in a number of events
- Others Gym, Swimming, Basketball, Squash, Cooking

Attended workshop

- 2008–2010 International Computer Vision Summer School, Sicily, Italy
- 2007–2010 Computer Vision Reading Group, Cambridge, UK
- 2007–2008 Geotechnical Research Reading Group, Cambridge, UK
- 04/2010 GRADschool, Wyboston, UK
- 05/2011 Startup Weekend, Amsterdam, the Netherlands
- 2008–2011 Graduate Development Programme
 - Creativity and innovation
 - From Lab to Market
 - Managing a business
 - Commercial Awareness

Additional Information

- 2001–2003 Worked as a part-time waiter in three different restaurants while studying towards A-level.
- 2001–2003 A volunteer shop assistant at Oxfam