



CHANG-YE TU

RESEARCH

Application of Signature in Generative AI

Sequential Decision Making under Uncertainty: Applications of

- Stochastic Optimal Control [9, 10, 5, 6, 7, 8]
- Theory of Optimal Stopping [1]
- Deep Learning and Reinforcement Learning [3]

Qualitative Methods in Inverse Scattering Theory

EDUCATION

PhD, Actuarial Science

Sep 2016 – Jul 2021

Department of Risk Management and Insurance
National Chengchi University, Taipei, Taiwan

Research topics:

- deep learning approach to option hedging [3]
- pricing and hedging problems of investment-linked insurance policies [4, 5]
- reinvestment risk of international bonds [1]
- optimal insurance regulatory scheme [10]

MSc, Applied Mechanics

Sep 1999 – Jun 2001

Institute of Applied Mechanics
National Taiwan University, Taipei, Taiwan

Research Topics:

- Stroh formalism in anisotropic elasticity
- numerical solution of boundary integral equation

BSc, Civil Engineering

Oct 1992 – Jun 1996

Department of Civil Engineering
National Taiwan University, Taipei, Taiwan

WORK EXPERIENCE

Project Assistant Professor

Feb 2022 – Current

Department of Mathematics
Soochow University, Taipei, Taiwan

Custom Software Developer

Mar 2005 – Sep 2016

Independent

- Developed and maintained a clinical information system exclusively built for Taiwan's National Health Insurance (NHI); the system has been adopted by several clinics in the region and ad hoc system support was provided.
- Developed and maintained an enterprise resource planning (ERP) system for a local machine parts manufacturer by using open source software; implemented security and vision inspection modules using [OpenCV](#).

LANGUAGE

Mandarin Native

English TOEIC 945 (2019)

German Elementary

CODING

Python 15+ yrs

C/C++ 15+ yrs

Java 2 yrs

R 15+ yrs

MATLAB™ 15+ yrs

HTML/CSS/JS 15+ yrs

LaTeX 15+ yrs

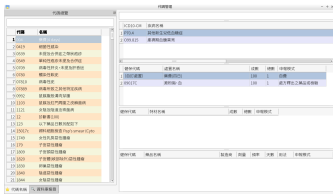
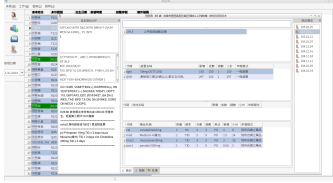
CONTACT

[chang-ye-tu.github.io](#)

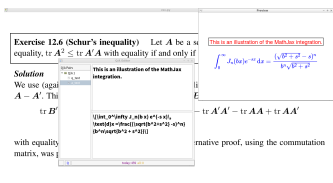
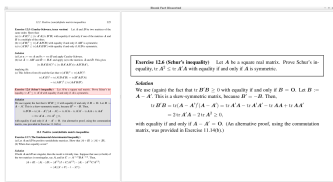
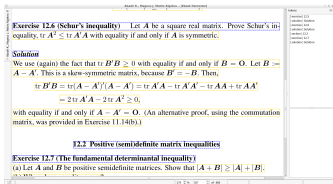
[chang-ye-tu](#)

All software projects and papers with accompanying code are hosted on [github](#).

MYCIS: A clinical information system built exclusively for Taiwan's National Health Insurance (NHI)



Ānanda: A collection of adaptive computer assisted learning / memorizing subroutines.



- Conducted symbolic manipulation (application of Itô lemma) and numerical solution of nonlinear PDE by using [Mathematica™](#) [8].
- Implemented Markov chain approximation method for numerically solving Hamilton-Jacobi-Bellman equations arising in asset allocation problem [6].

PUBLICATIONS

Journal Articles (peer reviewed)

- C.-Y. Tu^{*†} and S.-C. Chang, "Estimation of reinvestment risk of international bonds," *Review of Securities and Future Markets*, vol. 33, no. 4, pp. 77–102, 2021, (TSSCI).
- S.-C. Chang, Y.-K. Lee, W. Hsuan, and C.-Y. Tu, "Allocating overseas: Risk assessment of currency hedging in Taiwan life insurance industry," *Asia-Pacific Journal of Risk and Insurance*, vol. 14, no. 1, pp. 1–16, 2020, (EconLit).
- S.-C. Chang and C.-Y. Tu[†], "Dynamic hedging of options by deep learning," *Insurance Monograph*, vol. 36, no. 4, pp. 1–20, 2020.
- C.-Y. Tu[†] and S.-C. Chang, "Numerical valuation of double barrier options: The finite element method approach," *Journal of Risk Management*, vol. 21, no. 1, pp. 5–21, 2019.
- S.-C. Chang and C.-Y. Tu[†], "Optimal asset allocation under the liquidity constraint," *Journal of Risk Management*, vol. 20, no. 2, pp. 85–105, 2018.
- S.-C. Chang, C.-Y. Tu, and C.-H. Tsai, "Pension fund management using the Markov chain approximation," *Asia Pacific Management Review*, vol. 10, no. 4, pp. 259–266, 2005, (EconLit, TSSCI).
- S.-C. Chang, C.-Y. Tu, and Y.-S. Teng, "Speculating and hedging in optimal investment strategy for multi-period fund management," *Insurance Monograph*, vol. 19, no. 1, pp. 1–21, 2003.
- S.-C. Chang, C.-H. Tsai, C.-J. Tien, and C.-Y. Tu, "Dynamic funding and investment strategy for defined benefit pension schemes: Model incorporating asset-liability matching criterions," *Journal of Actuarial Practice*, vol. 10, pp. 131–155, 2002.

Preprints (submitted)

- W. Hsuan, C.-Y. Tu[†], and S.-C. Chang, "On Merton's optimal consumption-investment problem: A Lie symmetry analysis approach."
- C.-Y. Tu^{*†} and S.-C. Chang, "Optimal insurance solvency regulatory schemes under the early warning system."

AUTOBIOGRAPHY

I received my PhD in Actuarial Science from National Chengchi University. Previously I received my MSc in Applied Mechanics and BSc in Civil Engineering, both from National Taiwan University. Being initially trained in computational continuum mechanics and lately immersed in quantitative finance has equipped me with better understanding of the essence of interdisciplinary computing. Computing has been my greatest passion, and the aim of my research is to develop practical algorithmic solutions for real-world industrial problems.

The experience in scientific computing and quantitative finance coupled with decade long practices in computer-assisted learning/memorizing have shaped my thinking of effective learning and knowledge transfer. These experiences have built my confidence and an interest in teaching and I look forward to the opportunity to not only teach existing courses, but also work to develop new ones. I embrace every teaching opportunity, believe in keeping all my courses and tutoring sessions student-centered, and have worked enthusiastically and effectively with students at a variety of levels.