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Laboratory of Game-Theoretical Analysis

Research Field

Game Theory; Optimization; Operational Research;
Mathematical Economics

Education

Ph. D., Mathematics, National Dong
Hwa University, Taiwan

Publications

1.1. Journal Papers

- 1.1.1. Yan-An Hwang, **Yu-Hsien Liao*** (2025, Dec). Coincidence among potential and axiomatic approaches for a weighted resolution. *AMIS Mathematics*, 10(12), 28583-28605. (SCI). 本人為通訊作者.
- 1.1.2. Bo-Yao Wang and **Yu-Hsien Liao*** (2025, Sep). Game-theoretical analysis for resource allocating. *Engineering Letters*, 33(9), 3619-3627. (EI). 本人為通訊作者.
- 1.1.3. **Yu-Hsien Liao*** (2025, Sep). Dividend representations for two influence assessments. *Games*, 16(5), 46. (ESCI). 本人為第一作者、通訊作者.
- 1.1.4. Jong-Chin Huang, Kelvin H.-C. Chen, **Yu-Hsien Liao*** (2025, Jul). Resource allocation in multi-objective epidemic management: An axiomatic analysis. *Mathematics*, 13(13), 2182. (SCI). 本人為通訊作者.
- 1.1.5. Bo-Yao Wang and **Yu-Hsien Liao*** (2025, Jun). Conflict regulating under multitasking systems. *IAENG International Journal of Applied Mathematics*, 55(6), 1889-1897. (EI). 本人為通訊作者.
- 1.1.6. Boontida Uapipatanakul, Jong-Chin Huang, Kelvin H.-C. Chen and **Yu-Hsien Liao*** (2025, Jun). Effect examining under multiple goal processes. *Engineering Letters*, 33(6), 1851-1859. (EI). 本人為通訊作者.
- 1.1.7. **Yu-Hsien Liao*** (2025, Jun). Integrating axiomatic and dynamic mechanisms under industrial management situations: Game-theoretical analysis. *AIMS Mathematics*, 10(6), 14975-14995. (SCI). 本人為第一作者、通訊作者.
- 1.1.8. Hui-Chuan Wei, Ai-Tzu Li, Wei-Ni Wang, **Yu-Hsien Liao*** (2025, Feb). Game-theoretical Evaluating Rules for Minimizing Losses under Multi-objective Situations. *Engineering Letters*, 33(2), 265-274. (EI). 本人為通訊作者.
- 1.1.9. Yan-An Hwang and **Yu-Hsien Liao*** (2025, Feb). A resolution under interval uncertainty. *Mathematics*, 13(5), 762. (SCI). 本人為通訊作者.

- 1.1.10. Boontida Uapipatanakul, Jong-Chin Huang, Kelvin H.-C. Chen, Sirawit Ngammuangpak and **Yu-Hsien Liao*** (2025, Jan). Modeling Pollen Tube Polar Growth Pattern under Asymmetric Consideration and Creating Game-theoretical Model for Ecotoxicity Assessment. *LAENG International Journal of Applied Mathematics*, 55(1), 16-25. (EI). 本人為通訊作者.
- 1.1.11. **Yu-Hsien Liao*** (2024, Nov). Distribution concepts under duplicated structure. *Mathematics*, 12(22), 3609. (SCI). 本人為第一作者、通訊作者.
- 1.1.12. Jong-Chin Huang, Kelvin H.-C. Chen, **Yu-Hsien Liao*** (2024, Oct). Symmetric and asymmetric allocating concepts under multiple-goals. *Symmetry*, 16(11), 1428. (SCI). 本人為通訊作者.
- 1.1.13. **Yu-Hsien Liao*** (2024, Sep). Fuzzy assessment mechanisms under multi-objective considerations. *Mathematics*, 12(19), 3074. (SCI). 本人為第一作者、通訊作者.
- 1.1.14. Te-Chun Lee, Yen-Ching OuYang, Pang-Tung Liu and **Yu-Hsien Liao*** (2024, Aug). Evaluating mechanism and axiomatic processes under sustainability and multiple criteria fuzzy behavior. *Engineering Letters*, 32(8), 1667-1674. (EI). 本人為通訊作者.
- 1.1.15. **Yu-Hsien Liao*** (2024, May). Evaluating mechanism and related axiomatic results under multiple considerations. *Mathematics*, 12(9), 1415. (SCI). 本人為第一作者、通訊作者.
- 1.1.16. Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2023). Consistency and indexes of fuzzy games. *LAENG International Journal of Computer Science*, 50(4).
- 1.1.17. **Yu-Hsien Liao.** (2023). On the complement-reduction for fuzzy non-transferable-utility games. *Journal of Network and Computer Applications*. Volume 24, Number 11, 2439-2449.
- 1.1.18. **Liao, Y. H.** (2023) A weighted power distribution mechanism under transferable-utility systems: axiomatic results and dynamic processes. *Italian Journal of Pure and Applied Mathematics*, 440-454.
- 1.1.19. **Liao, Y. H.** (2023). Allocating Mechanism under Multicriteria Situations: Power Index and Relative Normalizations. *Engineering Letters*, 31(3).
- 1.1.20. Hwang, Y. A., & **Liao, Y. H.** (2023). Non-emptiness, relative coincidences and axiomatic results for the precore. *Mathematics*, 11(13), 2812.
- 1.1.21. **Liao, Y. H.** (2023). Power indices under specific multicriteria status. *Games*, 14(4), 51.
- 1.1.22. Chou, L. S., Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2023). Axiomatic processes for asymmetric allocation rules under fuzzy multicriteria situations. *Axioms*, 12(3), 284.
- 1.1.23. Hwang, Y. A., **Liao, Y. H.**, Wang, B. Y., & Chou, L. S. (2023). Outcomes and relative axiomatic results under multicriteria management models. *LAENG International Journal of Computer Science*, 50(1).
- 1.1.24. **Liao, Y. H.** (2023). A weighted solution concept under replicated behavior. *Mathematics*, 11(1), 150.
- 1.1.25. Hwang, Y. A., **Liao, Y. H.**, & Wang, B. Y. (2022). On balanced host games: a sufficient condition for non-emptiness of the core. *Mathematics*, 10(20), 3897.

- 1.1.26. **Liao, Y. H.** (2022). Solutions and characterizations under multicriteria management systems. *Journal of Industrial & Management Optimization*, 18(3).
- 1.1.27. Huang, R. R., Wei, H. C., Huang, C. Y., & **Liao, Y. H.** (2022). Axiomatic analysis for scaled allocating rule. *LAENG International Journal of Applied Mathematics*, 52(1).
- 1.1.28. **Liao, Y. H.** (2022). Axiomatic results and dynamic processes for two weighted indexes under fuzzy transferable-utility behavior. *Numerical Algebra, Control & Optimization*, 12(1).
- 1.1.29. **Liao, Y. H.** (2022). Balanced effectiveness of toxic mitigation measures under aquatic environments: game-theoretical analysis for combinatorial mechanism among antidotes and catalysts. *Engineering Letters*, 30(1).
- 1.1.30. **Liao, Y. H.**, & Chung, L. Y. (2022). Extended results of `Cores of fuzzy games and their convexity. *Iranian Journal of Fuzzy Systems*, 19(2), 99-103.
- 1.1.31. Hwang, Y. A., & **Liao, Y. H.** (2022). The replicated core under multi-choice non-transferable-utility situations: converse reduction axiomatic enlargements. *Mathematics*, 10(5), 806.
- 1.1.32. **Liao, Y. H.** (2022). Relative symmetric reductions under multi-choice non-transferable-utility situations. *Mathematics*, 10(5), 682.
- 1.1.33. Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2022). Axiomatisations, alternative formulation and dynamic processes for the maximal self-consistent value under multicriteria decision situations. *Journal of Control and Decision*, 9(1), 13-22.
- 1.1.34. **Liao, Y. H.**, & Chung, L. Y. (2022). Characterizations and dynamic results for consistent indexes under weighted consideration. *Journal of Control and Decision*, 9(1), 1-12.
- 1.1.35. **Liao, Y. H.**, Li, C. H., Chen, Y. C., Tsai, L. Y., Hsu, Y. C., & Chen, C. K. (2021). Agents, activity levels and utility distributing mechanism: game-theoretical viewpoint. *LAENG International Journal of Applied Mathematics*, 51(4), 1-7.
- 1.1.36. Huang, R. R., & **Liao, Y. H.** (2021). Axiomatic and dynamic results for power indexes under symmetry. *Axioms*, 10(4), 345.
- 1.1.37. **Liao, Y. H.** (2021). A normalized distribution mechanism under multi-criteria situations and fuzzy behavior. *Iranian Journal of Fuzzy Systems*, 18(6), 119-131.
- 1.1.38. Huang, J. C., Chen, K. H. C., & **Liao, Y. H.** (2021). Game-theoretic dynamic procedure for a power index under relative symmetry. *Symmetry*, 13(10), 1921.
- 1.1.39. Chi, E. C., **Liao, Y. H.**, & Li, C. H. (2021). Sustainable allocation mechanism for children's sports resource: game-theoretical analysis. *Journal of Cheng Kung University Physical Education Research*, 53(2), 62-82.
- 1.1.40. Cheng, C. Y., Zhang, G. J., **Liao, Y. H.**, & Chi, E. C. A note on alternative axiomatic results and sports applications of the precore. *Italian Journal of Pure and Applied Mathematics*, 480.

- 1.1.41. Li, C. H., Chiang, J. W., Chi, E. C., & **Liao, Y. H.** (2021). Axiomatic and dynamic processes for a symmetric allocation rule. *Symmetry*, 13(8), 1474.
- 1.1.42. Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2021). Sustainability for utility allocation: a game-theoretical mechanism. *Journal of Intelligent & Fuzzy Systems*, 41(1), 2485-2493.
- 1.1.43. Chang S. L., Lee K. C., Huang R. R., **Liao, Y. H.** (2021). Resource-allocation mechanism: game-theory analysis. *Symmetry*, 13(5), 799.
- 1.1.44. **Liao, Y. H.** (2021). A weighted power distribution mechanism under fuzzy behavior systems. *Journal of Intelligent & Fuzzy Systems*, 40(3), 3945-3956.
- 1.1.45. **Liao, Y. H.** (2021). Axiomatic results for weighted allocation rules under multiattribute situations. *Mathematics*, 9(6), 617.
- 1.1.46. Chi, E. C., Liou, J. N., Chen, K., Lin, H. L., & **Liao, Y. H.** (2021). Optimal utility allocations under multicriteria situation. *Journal of Control and Decision*, 8(1), 14-26.
- 1.1.47. Chen, K. H. C., Huang, J. C., & **Liao, Y. H.** (2021). Sustainable combination mechanism for catalysts: A game-theoretical approach. *Catalysts*, 11(3), 345.
- 1.1.48. Chi, E. C., & **Liao, Y. H.** (2021). Sustainable usability distribution mechanisms under multi-attribute sports management schemes. *Sustainability*, 13(3), 1528.
- 1.1.49. Hwang, Y. A., & **Liao, Y. H.** (2021). The similarity among two extended shapley values. *IAENG International Journal of Applied Mathematics*, 51(1), 1-7.
- 1.1.50. **Liao, Y. H.** (2021). Consonance, symmetry and extended outputs. *Symmetry*, 13(1), 72.
- 1.1.51. **Liao, Y. H.**, Huang, H. C., Wu, C.P., & Wu, Y. J. (2021). The replicated core: different reduction and related axiomatic results. *Far East Journal of Mathematical Sciences (FJMS)*.
- 1.1.52. Hwang, Y. A., & **Liao, Y. H.** (2020). Note: Natural extensions of the equal allocation of non-separable costs. *Engineering Letters*, 28(4).
- 1.1.53. **Liao, Y. H.**, Liu, P. T., Huang, R. R., Lee, K. C., & Chi, E. C. (2020). Resource allocation under sports management systems: game-theoretical methods. *Engineering Letters*, 28(4).
- 1.1.54. Du, W. S., Liu, P. T., & **Liao, Y. H.** (2020). On the mixed reduction: an alternative axiomatization of the fuzzy NTU core. *Results in Nonlinear Analysis*, 3(4), 179-184.
- 1.1.55. Hwang, Y. A., & **Liao, Y. H.** (2020). A solution concept and its axiomatic results under non-transferable-utility and multi-choice situations. *Mathematics*, 8(9), 1559.
- 1.1.56. Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2020). Different characterizations of a game-theoretical solution and its application on sports management. *Italian Journal of Pure and Applied Mathematics*, 658.
- 1.1.57. Cheng, C. Y., Chi, E. C., Chen, K., & **Liao, Y. H.** (2020). A power mensuration and its normalization

under multicriteria situations. *LAENG International Journal of Applied Mathematics*, 50(2), 1-6.

- 1.1.58. **Liao, Y. H.**, & Chung, L. Y. (2020). Power allocation rules under fuzzy behavior and multicriteria situations. *Iranian Journal of Fuzzy Systems*, 17(3), 187-198.
- 1.1.59. Chen, K. H. C., Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2020). The supreme-core on multicriteria fuzzy games. *Journal of Intelligent & Fuzzy Systems*, 38(2), 1753-1760.
- 1.1.60. **Liao, Y. H.**, Huang, K. W., & Hsiao, H.C. (2019). Different axiomatic results, formulation and weighted form for a resolution under uncertainty. *TARU Journal of Organizational Behavior & Analytics*.
- 1.1.61. Wei, H. C., Li, A. T., Wang, W. N., & **Liao, Y. H.** (2019). Solutions and its axiomatic results under fuzzy behavior and multicriteria situations. *LAENG International Journal of Applied Mathematics*, 49(4), 1-6.
- 1.1.62. Wei, H. C., Liu, P. T., & **Liao, Y. H.** (2019). Two optimal allocations under management systems: Game-theoretical approaches. *International Journal of Information and Management Sciences*, 30(2), 99-112.
- 1.1.63. **Liao, Y. H.** (2019). Power mensuration mechanism under fuzzy behavior and multicriteria situation. *Journal of Intelligent & Fuzzy Systems*, 36(6), 6631-6640.
- 1.1.64. **Liao, Y. H.**, & Chung, L. Y. (2019). Fuzzy transferable-utility games: a weighted allocation and related results. *Iranian Journal of Fuzzy Systems*, 16(3), 189-197.
- 1.1.65. **Liao, Y. H.**, Chen, T. Y., & Chung, L. Y. (2018). A power index and its normalization under fuzzy multicriteria situation. *Italian journal of pure and applied mathematics*, (40), 108-121.
- 1.1.66. **Liao, Y. H.** (2018). Power allocation rules under multicriteria situation. *Yugoslav Journal of Operations Research*, 28(2), 171-184.
- 1.1.67. **Liao, Y. H.** (2018). The excess formulation and related dynamic results for the consistent value. *American Journal of Mathematical and Management Sciences*, 37(3), 209-216.
- 1.1.68. **Liao, Y. H.**, Chen, K. N., Lin, H. L., & Chi, E. C. (2018). Utility allocation of sports management under uncertainty: dividend approach viewpoint. *Sports Research Review*, (145), 39-46
- 1.1.69. **Liao, Y. H.**, Chung, L. Y., Du, W. S., & Ho, S. C. (2018). Consistent solutions and related axiomatic results under multicriteria management systems. *American Journal of Mathematical and Management Sciences*, 37(2), 107-116.
- 1.1.70. **Liao, Y. H.** (2018). The precore: converse consistent enlargements and alternative axiomatic results. *Top*, 26(1), 146-163.
- 1.1.71. **Liao, Y. H.**, Liu, P. T., Tsai, M. H., Lin, Y. H. & Luo, Y. C. (2017). Allocation mechanisms under multicriteria situation: A power index and its normalization. *Journal of Interdisciplinary Mathematics*.
- 1.1.72. **Liao, Y. H.** (2017). Fuzzy games: a complement-consistent solution, axiomatizations and dynamic approaches. *Fuzzy Optimization and Decision Making*, 16, 257-268.
- 1.1.73. **Liao, Y. H.** (2017). The supreme-consistent value for fuzzy transferable-utility games: Alternative

formulation, dynamic process and axiomatizations 1. *Journal of Intelligent & Fuzzy Systems*, 33(1), 137-143.

- 1.1.74. **Liao, Y. H.**, Liu, P. T., & Chung, L. Y. (2017). The normalizations and related dynamic processes for two power indexes. *Journal of Control and Decision*, 4(3), 179-193.
- 1.1.75. Hwang, Y. A., & **Liao, Y. H.** (2017). Alternative formulation and dynamic process for the efficient Banzhaf–Owen index. *Operations Research Letters*, 45(1), 60-62.
- 1.1.76. Chung, L. Y., **Liao, Y. H.**, Hsieh, W. Y., Chen, T. Y., & Lin, C. K. (2016). Alternative reductions and axiomatizations of the unit-level-core. *Asia-Pacific Journal of Operational Research*, 33(06), 1650052.
- 1.1.77. **Liao, Y. H.** (2016). The consistent value: potentializability and equivalent relations on fuzzy games. *Appl. Math*, 10(5), 1871-1876.
- 1.1.78. **Liao, Y. H.** (2016). The D&P Shapley Value: a Weighted Extension. *Ukrainian Mathematical Journal*, 68(1).
- 1.1.79. **Liao, Y. H.** (2016). The consistent value for fuzzy games: alternative axiomatizations. *Fuzzy Optimization and Decision Making*, 15, 129-138.
- 1.1.80. **Liao, Y. H.**, Hsieh, W. Y., & Chung, L. Y. (2016). A consistent allocation and related results under fuzzy transferable-utility behavior 1. *Journal of Intelligent & Fuzzy Systems*, 30(6), 3167-3175.
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- 1.1.82. **Liao, Y. H.** (2016). The excess formulations and related results for the normalized Banzhaf index and the Shapley value. *Top*, 24(1), 233-241.
- 1.1.83. Hwang, Y. A., **Liao, Y. H.**, & Yeh, C. H. (2015). Consistent extensions and subsolutions of the core for the multichoice transferable-utility games. *Optimization*, 64(4), 913-928.
- 1.1.84. **Liao, Y. H.**, Chung, L. Y., & Wu, P. H. (2015). The EANSC: A weighted extension and axiomatization. *Economics Bulletin*, 35(1), 475-480.
- 1.1.85. Chung, L. Y., & **Liao, Y. H.** (2014). A consistent allocation rule: non-emptiness, reductions, domination and axiomatization. *Review of Economics & Finance*, 4, 61-74.
- 1.1.86. Hwang, Y. A., & **Liao, Y. H.** (2014). The core configuration for fuzzy games. *Journal of Intelligent & Fuzzy Systems*, 27(6), 3007-3014.
- 1.1.87. **Liao, Y. H.**, & Chung, L. Y. (2014). The minimal consistent core: a converse consistent enlargement and alternative axiomatizations. *Far East Journal of Mathematical Sciences*, 94(1), 113.
- 1.1.88. **Liao, Y. H.** (2014). Solutions, potentializability and axiomatizations under interval uncertainty. *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 22(04), 605-613.
- 1.1.89. **Liao, Y. H.** (2013). The equal allocation of nonseparable costs: An extension under fuzzy behavior.

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- 1.1.90. Hwang, Y. A., & **Liao, Y. H.** (2013). Reduction and dynamic approach for the multi-choice shapley value. *Journal of Industrial & Management Optimization*, 9(4).
- 1.1.91. **Liao, Y. H.** (2013). The duplicate extension for the equal allocation of nonseparable costs. *Operational Research*, 13, 385-397.
- 1.1.92. Hwang, Y. A., & **Liao, Y. H.** (2013). A note on the core: Minimal conversely consistent enlargement. *Information Sciences*, 243, 100-105.
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- 1.1.98. Hwang, Y. A., & **Liao, Y. H.** (2011). The multi-core, balancedness and axiomatizations for multi-choice games. *International Journal of Game Theory*, 40, 677-689.
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- 1.1.100. **Liao, Y. H.** (2011). Dynamic Approaches for Multichoice Solutions. *Advances in Operations Research*, 2011.
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- 1.1.102. **Liao, Y. H.** (2010). Alternative axiomatizations of the core under the mixed reduction. *Far East Journal of Mathematical Sciences* 47(1), 87-97.
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- 1.1.105. Hwang, Y. A., & **Liao, Y. H.** (2010). Consistency and dynamic approach of indexes. *Social Choice and Welfare*, 34, 679-694.

- 1.1.106. **Liao, Y. H.** (2010). Consistent extensions and subsolutions of the core of multi-choice NTU games. *4OR*, 8, 71-85.
- 1.1.107. **Liao, Y. H.** (2010). V-N Reduction and Axiomatization of the Core of Fuzzy Games. *Far East Journal of Mathematical Sciences* 38(1), 85-94.
- 1.1.108. Huang, Y. H., Huang, R. R., & **Liao, Y. H.** (2009). Dynamic approach and sport application for the P&Z Shapley value. *Journal of Chung Jen Junior College of Nursing, Health Science and Management*, (3), 13-20.
- 1.1.109. Hwang, Y. A., & **Liao, Y. H.** (2009). Equivalence theorem, consistency and axiomatizations of a multi-choice value. *Journal of Global Optimization*, 45, 597-613.
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- 1.1.112. Hwang, Y. A., & **Liao, Y. H.** (2009). The consistent value of fuzzy games. *Fuzzy Sets and Systems*, 160(5), 644-656.
- 1.1.113. **Liao, Y. H.** (2008). The maximal equal allocation of nonseparable costs on multi-choice games. *Economics Bulletin*, 3(70), 1-8
- 1.1.114. Hwang, Y. A., & **Liao, Y. H.** (2008). Potentializability and consistency for multi-choice solutions. *Spanish economic review*, 10, 289-301.
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- 1.1.119. **Liao, Y. H.** (2008). The solutions for multi-choice games: TU games approach. *Economics Bulletin*, 3.43, 1-7.
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- 1.1.121. Hwang, Y. A., & **Liao, Y. H.** (2008). Max-consistency, complement-consistency and the core of fuzzy games. *Fuzzy Sets and Systems*, 159(2), 152-163.
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Academic Projects

2.1 專題研究計畫

2.1.1 114 年度：HiBERT: 結合表觀基因組模式與三維空間結構的語言模型框架-共同主持人

2.1.2 112 年度：基於運動性能評估不同止痛藥對斷鰭斑馬魚的療效及機制探討-共同主持人

2.1.3 111 年度：邊際貢獻：模糊行為與多目標情境下不一樣的延伸形式及相關的解-計畫主持人

2.1.4 111 年度：以碎形維度和熵來解析斑馬魚處於單重及雙重逆境之行為模式-共同主持人

2.1.5 110 年度：在不確定性下的權力指標及其公設化結果-計畫主持人

2.1.6 109 年度：外部加權和內部修正之下的解-計畫主持人

2.1.7 108 年度：利益可交換賽局上紅利函數、公設化與動態過程之間關係-計畫主持人

2.1.8 107 年度：模糊賽局上的權力指標-計畫主持人

2.1.9 106 年度：區間利益不可交換賽局上解的公設化與動態過程-計畫主持人

2.1.10 105 年度：利益可交換賽局上的加權解及其相關結果-計畫主持人

2.1.11 104 年度：賽局理論上解的另類觀點表示式以及相關的公設化與動態過程-計畫主持人

2.1.12 103 年度：利益不可轉換賽局上的解及相關的公設化-計畫主持人

2.1.13 101 年度：合作賽局中退化局、超量函數與解的動態過程之間的關係-計畫主持人

2.1.14 100 年度：利益可交換區間賽局上的解及公設化-計畫主持人

2.1.15 99 年度：合作對局上解的一致性及其一致性的拓展-計畫主持人

2.1.16 98 年度：多重選擇對局上的解、退化局及公設化-計畫主持人

<https://arspb.nstc.gov.tw/NSCWebFront/modules/talentSearch/talentSearch.do?action=initRsm17new&rsNo=a5dafabfa853434b9173f3836ec8b7b9&LANG=eng>

Relevant Experience

2023—Present : Distinguished Professor, Department of Applied Mathematics, National Pingtung University.

2015—Present : Professor, Department of Applied Mathematics, National Pingtung University.

2012—2015: Associate Professor, Department of Applied Mathematics, National Pingtung University.

2009—2012: Assistant Professor, Department of Applied Mathematics, National Pingtung University.

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