



研究重點





教學重點

授課科目：

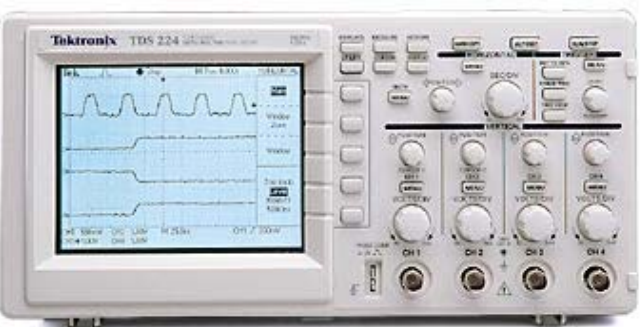
大學部 -
電路學、電子學、動態系統、自動
控制、工程量測、智慧型機器人
研究所 -
工程最佳化設計、遺傳演算法則、
仿生計算、類免疫系統/網路



教學重點

教學設備：

數位示波器、直流電源供應器、
函數波信號產生器共27套

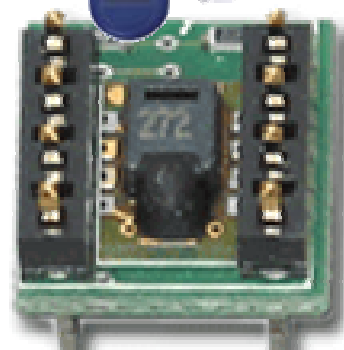
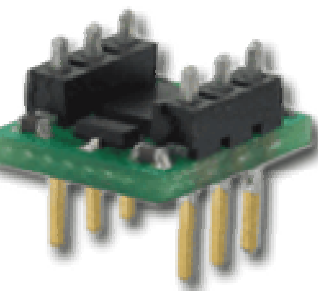




教學重點

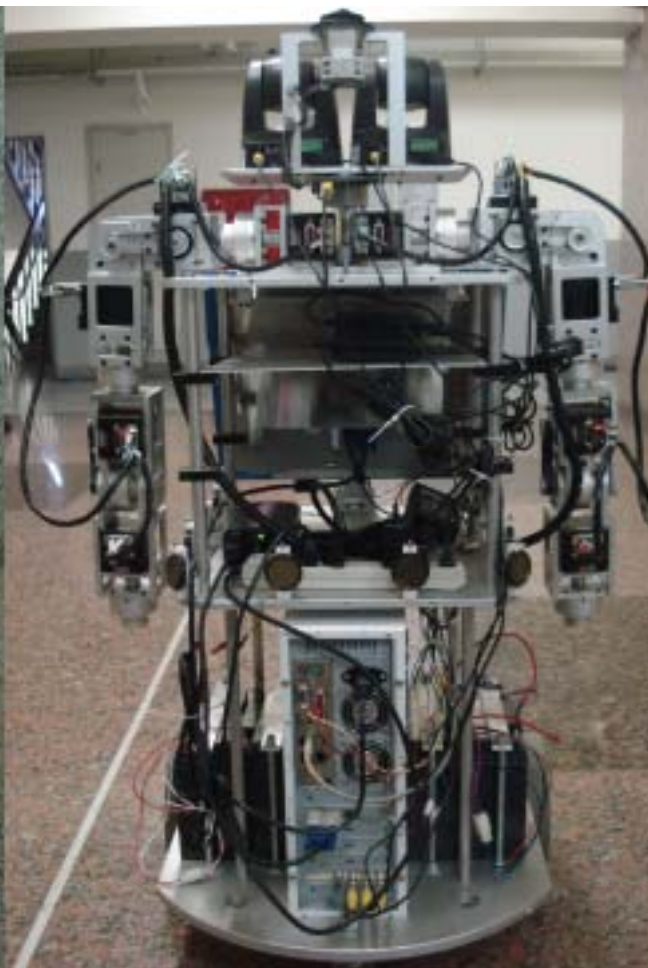
教學設備：

各式感測器含超音波、紅外線、電子羅盤、加速計、溫濕度、壓力、熱電耦、CCD攝影機、RFID等9組各5套





研究重點 智慧型雙臂導覽/保全機器人

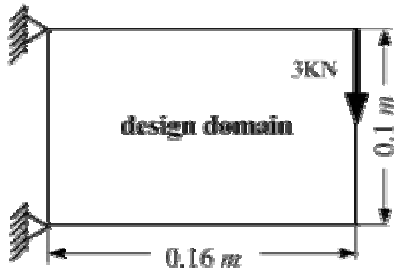




研究重點

工程最佳化設計

拓樸最佳化



$d^{max} = 0.876mm$
Area = 236
obj = 0.00484



$d^{max} = 0.817mm$
Area = 253
obj = 0.00486



$d^{max} = 0.619mm$
Area = 269
obj = 0.00681



$d^{max} = 0.681mm$
Area = 290
obj = 0.00506



$d^{max} = 0.728mm$
Area = 268
obj = 0.00513



$d^{max} = 0.529mm$
Area = 313
obj = 0.00624



$d^{max} = 0.434mm$
Area = 312
obj = 0.00739



$d^{max} = 0.178mm$
Area = 333
obj = 0.01687



$d^{max} = 0.633mm$
Area = 312
obj = 0.00506



$d^{max} = 0.680mm$
Area = 281
obj = 0.00523



$d^{max} = 0.297mm$
Area = 270
obj = 0.01247



$d^{max} = 0.670mm$
Area = 319
obj = 0.00468



$d^{max} = 0.565mm$
Area = 322
obj = 0.0055



$d^{max} = 0.590mm$
Area = 304
obj = 0.00558

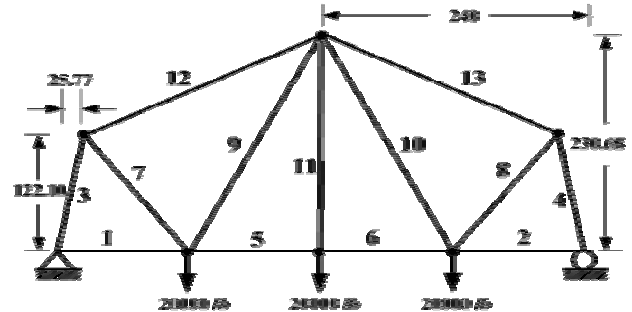


$d^{max} = 0.572mm$
Area = 319
obj = 0.00548

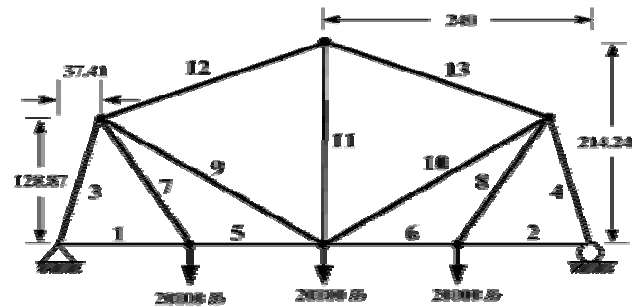


$d^{max} = 0.640mm$
Area = 299
obj = 0.00523

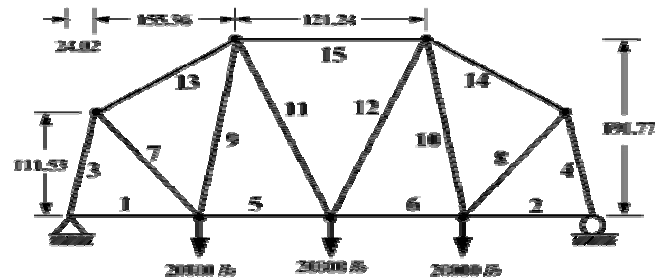
桁架最佳化



(a) 8-node 13-member truss



(b) 8-node 13-member truss

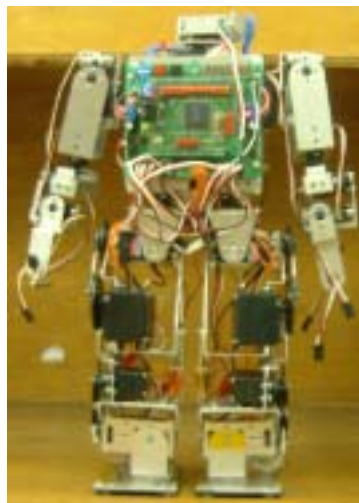


(c) 9-node 15-member truss



研究重點

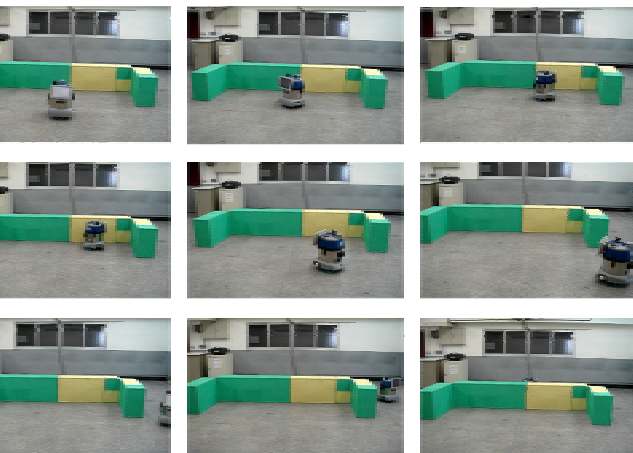
人型二足步行機器人



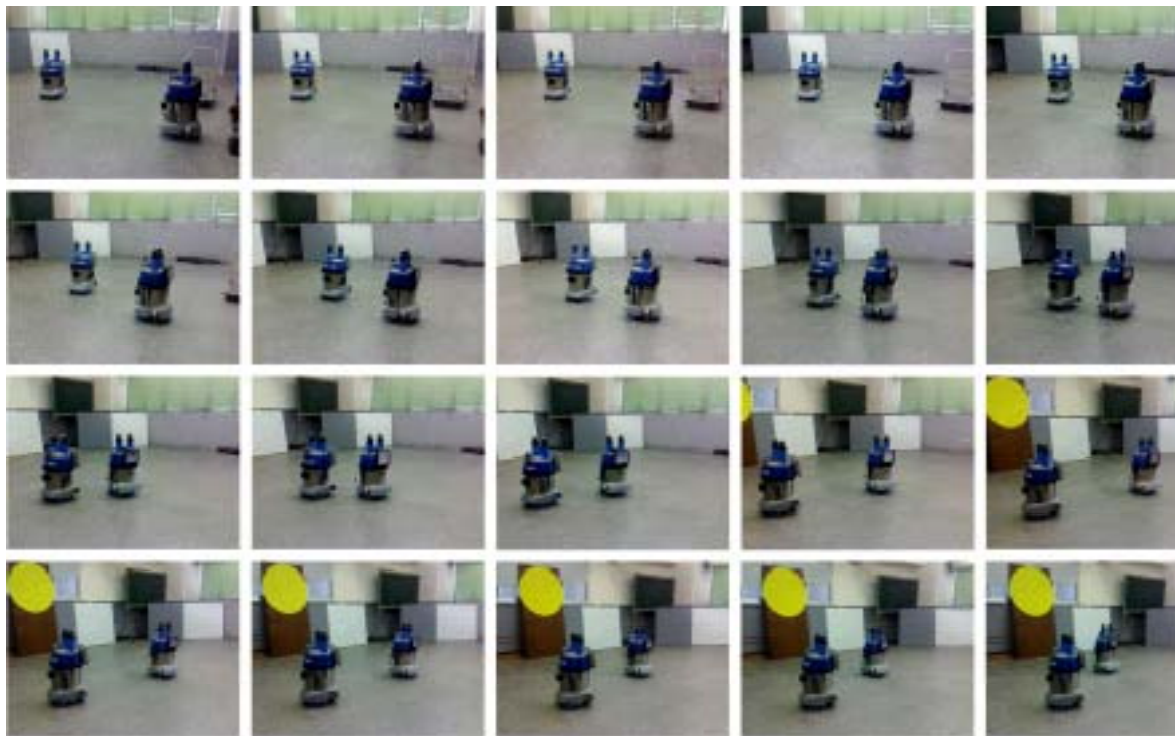


研究重點

智慧型控制



機器人靜態避障



機器人動態避障



重要設備



SMART Motor



全景式攝影機



數位攝影機



雷射測距儀



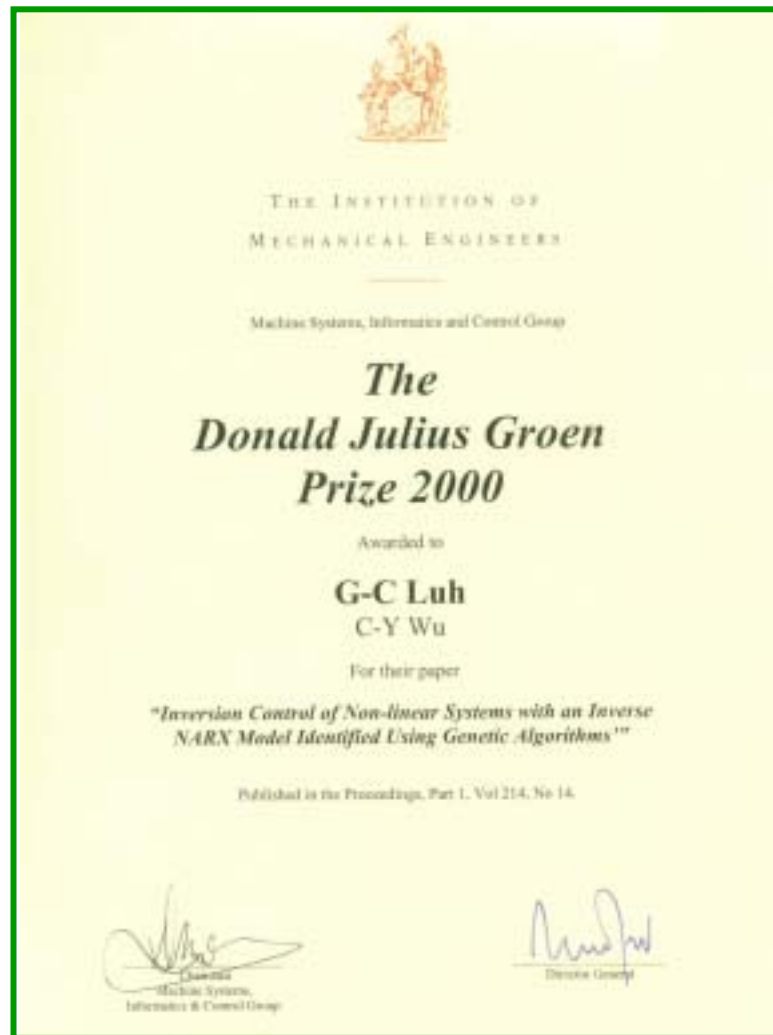
影像擷取卡



中控電腦



研究成果 英國機械工程師學會2000年最佳期刊論文獎





研究成果

國科會研究計畫

智慧型服務機器人與智慧生活空間研發(二年期計畫)

仿生控制智慧型服務機器人

類免疫系統/網路之研究及工程應用 (二年期計畫)

人形二足步行機器人與機器人足球賽(二年期計畫)

人工免疫演化法則及其在機械臂軌跡追蹤控制上之應用

智慧型多機器人系統及機器足球員之研究(二年期計畫)

利用遺傳演算法則最佳化設計馬達之研究

智慧型自主性移動式機器人之研究

渦卷式壓縮機渦卷曲線之合成研究

以遺傳學習類神經演算法則辨識非線性多輸入多輸出系統模

式



研究成果

國際期刊論文

- 1] Guan-Chun Luh and Chung-Huei Chueh, "A multi-modal immune algorithm for the job-shop scheduling problem," *Information Sciences*, Vol. 179, No. 10, pp. 1516-1532, 2009.
- 2] Guan-Chun Luh and Chun-Yi Lin, "Optimal design of truss structures using immune algorithm," *Structural and Multidisciplinary Optimization*, Vol. 36, No. 4, pp. 365 – 379, 2008.
- 3] Guan-Chun Luh and Wei-Wen Liu, "An immunological approach to mobile robot reactive navigation," *Applied Soft Computing*, Vol. 8, No. 1, pp. 30-45, 2008.
- 4] Guan-Chun Luh and Wei-Wen Liu, "Motion Planning for Mobile Robots in Dynamic Environments Using Potential Field Immune Network," *Proceedings of the Institution of Mechanical Engineers, Part I, Journal of Systems and Control Engineering*, Vol. 221, No. 7, pp. 1033-1047, 2007.
- 5] Guan-Chun Luh and Chung-Huei Chueh, "Job Shop Scheduling Optimization Using Multi-modal Immune Algorithm," *Lecture Notes in Artificial Intelligence*, Vol. 4570, pp. 1127-1137, 2007.
- 6] Guan-Chun Luh and Wei-Wen Liu, "Dynamic Mobile Robot Navigation Using Potential Field Based Immune Network," *Journal of Systemics, Cybernetics, and Informatics*, Vol. 5, No. 2, pp. 43-50, 2007.



研究成果

國際期刊論文

- [7] Guan-Chun Luh and Wei-Chong Cheng, "Immune Model-Based Fault Diagnosis," *Mathematics and Computers in Simulation*, Vol. 67, pp. 515-539 卅 2005
- [8] Guan-Chun Luh and Chung-Huei Chueh, "Multi-modal topological optimization of structure using immune algorithm," *Computer Methods in Applied Mechanics and Engineering*, Vol. 193, No. 36-38, pp. 4035-4055, 2004
- [9] Guan-Chun Luh, Chun-Yin Wu and Wei-Chong Cheng, "Artificial immune regulation (AIR) for model-based fault diagnosis," *Lecture Notes in Computer Science*, Vol. 3239, pp. 28-41, September, 2004.
- [10] Guan-Chun Luh and Wei-Wen Liu, "Reactive Immune Network Based Mobile Robot Navigation," *Lecture Notes in Computer Science*, Vol. 3239, pp. 119-132, September, 2004.
- [11] Guan-Chun Luh and Wei-Chong Cheng, "Identification of immune models for fault detection," *Proc. Instn. Mech. Engrs. Part I: J. System and Control Engineering*, Vol. 218, No. 5, pp. 353-367, August, 2004.
- [12] Guan-Chun Luh and Chung-Huei Chueh, "Multi-objective optimal design of truss structure with immune algorithm," *Computers and Structures*, Vol. 82, No. 11-12, pp. 829-844, May, 2004.



研究成果

國際期刊論文

[13] Guan-Chun Luh, Chung-Huei Chueh, and Wei-Wen Liu, "MOIA: Multi-Objective immune algorithm," *Engineering Optimization*, Vol. 35, No.2, pp. 143-164, 2003.

[14] Guan-Chun Luh and Wei-Chong Cheng, "Behavior-Based Intelligent Mobile Robot Using Immunized Reinforcement Adaptive Learning Mechanism," *Advanced Engineering Informatics*, Vol. 16, No. 2, pp. 85-98, 2002.

[15] Guan-Chun Luh and Wei-Chong Cheng, "Non-Linear System Identification Using an Artificial Immune System," *Proc. Instn Mech. Engrs., Part I, Journal of Systems and Control Engineers*, Vol. 215, pp. 569-585, 2001.

[16] Guan-Chun Luh and Chun-Yin Wu, "Inversion Control of Nonlinear Systems with Inverse NARX Model Identified Using Genetic Algorithms," *Journal of Systems and Control Engineers*, Vol. 214, pp. 259-271, 2000.

[17] Guan-Chun Luh and Ren-Ming Hwang, "Measuring Non-Uniform Residual Stress in Thin Plates by a Proposed Hole-Drilling Strain Gauge Method," *The International Journal of Advanced manufacturing Technology*, Vol. 15, pp. 103-113, 1999.

[18] Guan-Chun Luh and Chun-Yin Wu, "Nonlinear System Identification Using Genetic Algorithms," *Proc. Instn Mech. Engrs., Part I, Journal of Systems and Control Engineers*, Vol. 213, pp. 105-117, 2000.