

CURRICULUM VITAE

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CONTACT INFORMATION

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CITIZENSHIP

Canadian

EDUCATION

Ph.D. Department of Agricultural and Biosystems Engineering (was renamed Department of Bioresource Engineering), McGill University, Canada. 1995 - 2000

Dissertation: *Development of a Weed Management System for Precision Farming*

M.Sc. Department of Agricultural and Biosystems Engineering (was renamed Department of Bioresource Engineering), McGill University, Canada. 1993 - 1995

Thesis: *Applications of Artificial Neural Network Technology in the Design of Water-table Management Systems*

B.Sc. Department of Agricultural Machinery Engineering (was renamed Department of Bio-Industrial Mechatronics Engineering), National Taiwan University, Taiwan, R.O.C. 1986 - 1990

PROFESSIONAL EXPERIENCE

Research Experience. 2000 – present

- Research Associate, Instrumentation and Sensing Laboratory, Agricultural Research Service, United States Department of Agriculture, joint position as Postdoctoral Scholar, Department of Biosystems and Agricultural Engineering, University of Kentucky. **Research accomplishments** include hyperspectral / multispectral imaging system development, food safety online inspection, machine vision, computer modeling, system integration and control, artificial intelligence application. 2003 – present
- Postdoctoral Fellow, Department of Agricultural and Biosystems Engineering, McGill University. **Research accomplishments** include remote sensing application,

hyperspectral imaging system development, precision agriculture, artificial intelligence application, weed management modeling, water resource management modeling, agrochemical management modeling, geographic information system application, preparation of proposals for grant application. 2000 – 2002

Teaching Experience. 1996 – 2000

- Guest Speaker, Soil and Water Quality Management (330-435A), Department of Natural Resource Sciences, McGill University. **Responsibilities** include teaching 25 senior undergraduate and graduate students for application of artificial intelligence to hydrologic modeling, and being a consultant for them. September – December, 2000
- Instructor, Structured Computer Programming (336-252A), Department of Agricultural and Biosystems Engineering, McGill University. **Responsibilities** include teaching 23 junior undergraduate students for FORTRAN 90 and MATLAB computer languages, and being a consultant for them. September - December, 2000
- Teaching Assistant, Geographic Information System for Biosystems Management, Department of Agricultural and Biosystems Engineering, McGill University. **Responsibilities** include teaching 10 to 20 senior undergraduate and graduate students for IDRISI GIS software, designing and correcting their assignments, being a consultant for them, and maintaining the software in the network. 1997 – 1998
- Teaching Assistant, Structured Computer Programming, Department of Agricultural and Biosystems Engineering, McGill University. **Course responsibilities** include teaching 15 to 25 junior undergraduate students for FORTRAN 77 and FORTRAN 90 computer languages, designing and correcting their assignments, being a consultant for them, marking their examinations, and maintaining the software in the network. 1996 – 1998

Consulting and Extension Experience. 2001 – present

- Artificial Neural Network Model for the Prediction of Nitrate Concentrations in the Phreatic Aquifer of Esposende and Vila do Conde, project ref. POCTI/MGS/47182/2002, the Science and Technology Foundation of the Portuguese Science and Superior Education Ministry, Portugal. **Responsibilities** include offering experience applying artificial neural network to modeling, guiding data collection, guiding model development, and helping to write and proofread academic papers. 2004 - 2005
- Water Consumption Modelling in Northern China, Canadian International Development Agency (CIDA) 3x3 Project, involving four Canadian universities (McGill University, University of Toronto, University of British Columbia and University of Montreal) and three Chinese universities (Beijing University, Chinghua University and Nankai University), funded by Canadian International Development Agency (CIDA), Canada. **Responsibilities** include offering experience using IDRISI GIS software, guiding GIS model development, and helping to write and proofread academic papers. January – July, 2001

- Efficient Planning of Montreal Urban Forests by Means of a Decision Making Computerized System Project, Canada. **Responsibilities** include offering experience applying artificial neural network and decision tree to modeling, guiding data collection, analyzing data, developing models, and helping to write academic papers. January – May, 2001

PROFESSIONAL ORGANIZATION MEMBERSHIP AND ACTIVITIES

- Member of the American Society of Agricultural and Biological Engineers (ASABE). 1995 – present
 - Committee Member of ASABE Information and Electrical Technologies Division, IET-312 Machine Vision. 2004 – present
- Member of Canadian Society for Engineering in Agriculture, Food and Biological Systems (CSAE). 1995 - present

AWARDS AND HONORS

- Recipient of the Honorable Mention, BARC Poster Day, Beltsville Agriculture Research Center, Beltsville Area, USDA-ARS. 2006
 - Area-wide competition
- Recipient of the Second Prize, BARC Poster Day, Beltsville Agriculture Research Center, Beltsville Area, USDA-ARS. 2004
 - Area-wide competition
- Recipient of Formation de chercheurs et l'aide à la recherche (FCAR) (Recipient of Funds for the training of researchers and the assistance with research), Quebec, Canada. 1997-1998
 - Nationwide competition
- Recipient of Canadian Water Resources Association Graduate Scholarship, Canada. 1996
 - Nationwide competition

PROFESSIONAL SERVICE

Manuscript reviewer for the following technical journals (listed alphabetically). 1999 – present

- Biosystems Engineering
- Canadian Water Resources Journal
- Canadian Biosystems Engineering
- Computers and Electronics in Agriculture
- Hydrological Sciences Journal
- Journal of the American Water Resources Association
- Soil Science Society of America Journal

- Transactions of the ASAE

REFEREED PUBLICATIONS

1. Chao, K., Y.-R. Chen, F. Ding, **C.-C. Yang** and D.E. Chan. 2006. Development of two-band color-mixing technique for identification of broiler carcass conditions. *Journal of Food Engineering*, in press.
2. **Yang, C.-C.**, K. Chao, Y. R. Chen, M. S. Kim and H. L. Early. 2006. Simple region of interest analysis for systemically diseased chicken identification using multispectral imaging. *Transactions of the ASAE*, 49(1): 245-257.
3. **Yang, C.-C.**, K. Chao, Y. R. Chen and H. L. Early. 2005. Systemically diseased chicken identification using multispectral images and region of interest analysis. *Computers and Electronics in Agriculture*, 49(2): 255-271.
4. **Yang, C.-C.**, K. Chao and Y. R. Chen. 2005. Development of multispectral imaging processing algorithms for identification of wholesome, septicemia, and inflammatory process chickens. *Journal of Food Engineering*, 69(2): 225-234.
5. **Yang, C.-C.**, S. O. Prasher, R. Lacroix and S. H. Kim. 2004. Application of multivariate adaptive regression splines (MARS) to simulate soil temperature. *Transactions of the ASAE*, 47(3): 881-887.
6. **Yang, C.-C.**, S. O. Prasher and P. K. Goel. 2004. Differentiation of crop and weeds by decision-tree analysis of multi-spectral data. *Transactions of the ASAE*, 47(3): 873-879.
7. **Yang, C.-C.**, S. O. Prasher, R. Lacroix and S. H. Kim. 2003. A multivariate adaptive regression spines model for simulation of pesticide transport in soils. *Biosystems Engineering*, 86(1): 9-15.
8. **Yang, C.-C.**, S. O. Prasher, P. Enright, C. Madramootoo, M. Burgess, P. K. Goel and I. Callum. 2003. Application of decision tree technology for image classification using remote sensing data. *Agricultural Systems*, 76(3): 1101-1117.
9. **Yang, C.-C.**, S. O. Prasher, J.-A. Landry and H. S. Ramaswamy. 2003. Development of a herbicide application map using artificial neural networks and fuzzy logic. *Agricultural Systems*, 76(2): 561-574.
10. **Yang, C.-C.**, S. O. Prasher and J.-A. Landry. 2003. Development of an image processing system and a fuzzy controller for site-specific herbicide applications. *Precision Agriculture*, 4(1): 5-18.

11. **Yang, C.-C.**, S. O. Prasher and J.-A. Landry. 2002. Weed recognition in corn fields using back-propagation neural network models. *Canadian Biosystems Engineering*, 44:715-722.
12. **Yang, C.-C.**, S. O. Prasher, J. Whalen and P. K. Goel. 2002. Use of hyperspectral imagery for identification of different fertilization methods with decision tree technology. *Biosystems Engineering*, 83(3): 291-298.
13. **Yang, C.-C.**, S. O. Prasher, J.-A. Landry and H. S. Ramaswamy. 2002. Development of neural networks for weed recognition in corn fields. *Transactions of the ASAE*, 45(3): 859-864.
14. **Yang, C.-C.**, S. O. Prasher, J.-A. Landry and R. Kok. 2002. The development of image processing and weed localization algorithms for precision farming. *Biosystems Engineering*, 81(2): 137-146.
15. **Yang, C.-C.**, S. O. Prasher, J.-A. Landry, J. Perret and H. S. Ramaswamy. 2000. Recognition of weeds with image processing and their use with fuzzy logic for precision farming. *Canadian Agricultural Engineering*, 42(4): 195-200.
16. **Yang, C.-C.**, S. O. Prasher, J.-A. Landry, H. S. Ramaswamy and A. DiTommaso. 2000. Application of artificial neural networks in image recognition and classification of crop and weeds. *Canadian Agricultural Engineering*, 42(3): 147-152.
17. **Yang, C.-C.**, C. S. Tan and S. O. Prasher. 2000. Artificial neural networks for subsurface drainage and subirrigation systems in Ontario, Canada. *Journal of the American Water Resources Association*, 36(3): 609-618.
18. **Yang, C.-C.**, S. O. Prasher and C. S. Tan. 1999. An artificial neural network model for water table management systems. *Canadian Water Resources Journal*, 24(1): 25-33.
19. **Yang, C.-C.**, R. Lacroix, and S. O. Prasher. 1998. The use of back-propagation neural networks for the simulation and analyses of time-series data in subsurface drainage systems. *Transactions of the ASAE*, 41(4): 1181-1187.
20. **Yang, C.-C.**, S. O. Prasher, R. Lacroix and A. Madani. 1997. Application of Artificial neural networks in subsurface drainage system design. *Canadian Water Resources Journal*, 22(1): 1-12.
21. **Yang, C.-C.**, S. O. Prasher, R. Lacroix, S. Sreekanth, A. Madani and L. Masse. 1997. Artificial neural network model for subsurface-drained farmlands. *Journal of Irrigation and Drainage Engineering*, 123(4): 285-292.
22. **Yang, C.-C.**, S. O. Prasher and G. R. Mehuys. 1997. An artificial neural network to estimate soil temperature. *Canadian Journal of Soil Science*, 77(3): 421-429.

23. **Yang, C.-C.**, S. O. Prasher, G. R. Mehuys and N. K. Patni. 1997. Application of artificial neural networks for simulation of soil temperature. *Transactions of the ASAE*, 40(3): 649-656.
24. **Yang, C.-C.**, S. O. Prasher, S. Sreekanth, N. K. Patni and L. Masse. 1997. An artificial neural network model for simulating pesticide concentrations in soil. *Transactions of the ASAE*, 40(5): 1285-1294.
25. Sreekanth, S., S. O. Prasher and **C.-C. Yang**. 1997. Importance of choice of input parameters in artificial neural network simulation of water-table depths. *Canadian Water Resource Journal*, 22(2): 111-124.
26. **Yang, C.-C.**, S. O. Prasher and R. Lacroix. 1996. Applications of artificial neural networks to simulate water-table depths under subirrigation. *Canadian Water Resources Journal*, 21(1): 27-44.
27. **Yang, C.-C.**, S. O. Prasher and R. Lacroix. 1996. Applications of artificial neural networks to land drainage engineering. *Transactions of the ASAE*, 39(2): 525-533.

REFEREED PUBLICATIONS UNDER REVIEW

1. **Yang, C.-C.**, K. Chao, Y.-R. Chen, M. S. Kim and D. E. Chan. 2006. Development of Fuzzy Logic-based Differentiation Algorithm and Fast Line-Scan Imaging System for Chicken Inspection. *Biosystems Engineering*.
2. **Yang, C.-C.**, S. O. Prasher, S. Wang, S. H. Kim, C. S. Tan, C. Drury and R. M. Patel. 2006. Simulation of nitrate-n pollution in southern Ontario with DRAINMOD-N. *Agricultural Water Management*.
3. Wang, S., S. O. Prasher, **C.-C. Yang**, S. H. Kim, A. Madani, P. M. MacDonald and S. D. Robertson. 2005. Field validation of DRAINMOD-N in cold regions. *Computers and Electronics in Agriculture*.

CONFERENCE PROCEEDINGS AND TECHNICAL REPORTS

1. **Yang, C.-C.**, K. Chao, Y. R. Chen, and M. S. Kim. 2006. Line-Scan Machine Vision System for Online Poultry Carcass Inspection. April 26, 2004, *BARC Poster Day*. Beltsville Agriculture Research Center, USDA-ARS.
2. **Yang, C.-C.**, K. Chao, Y. R. Chen and M. S, Kim. 2005. Development of fast line scanning imaging algorithm for diseased chicken detection. *Optical Sensors and Sensing Systems for natural Resources and Food Safety and Quality, Proceedings of SPIE, Volume 5996*, p. 59960C-1-59960C-12. OpticsEast 2005, Boston, MA, USA, October 22-23, 2005. The International Society for Optical Engineering.

3. **Yang, C.-C.**, S. O. Prasher and J. Whalen. 2005. Application of hyperspectral imagery and prediction algorithms to precision agriculture. *The American Society of Agricultural Engineers (ASAE), 2005 international meeting*, paper no. 05-1062.
4. **Yang, C.-C.**, K. Chao, Y. R. Chen and H. L. Early. 2005. Application of multispectral imaging for wholesome and systemically diseased chickens. *The American Society of Agricultural Engineers (ASAE), 2005 international meeting*, paper no. 05-3125.
5. Chao, K., Y. R. Chen, **C.-C. Yang**, and D. E. Chan. 2005. Characterizing spectra variations for cleaning and sanitation issues in poultry processing plant *The American Society of Agricultural Engineers (ASAE), 2005 international meeting*, paper no. 05-3035.
6. Abreu, A. S., S. O. Prasher and **C.-C. Yang**. 2005. Development of REDENITRA, an artificial neural network clone of RZWQM model, for the simulation of nitrate-N leaching. *The American Society of Agricultural Engineers (ASAE), 2005 international meeting*, paper no. 05-2112.
7. Abreu, A. S., S. O. Prasher and **C.-C. Yang**. 2005. REDENITRA, a backpropagation artificial neural network (BANN) model, clone of RZWQM, that predicts the amount of nitrate-N leaching in agricultural systems. *EGU General Assembly 2005*. Vienna, Austria.
8. **Yang, C.-C.**, K. Chao, Y. R. Chen and H. L. Early. 2004. Systemically diseased chicken identification using multispectral images and region of interest analysis. *Nondestructive Sensing for Food Safety, Quality, and Natural Resources, Proceedings of SPIE, Volume 5587*, p. 121-132. OpticsEast 2004, Philadelphia, PA, USA, October 26-27, 2004. The International Society for Optical Engineering.
9. **Yang, C.-C.**, K. Chao and Y. R. Chen. 2004. Development of multispectral imaging processing algorithms for Identification of Wholesome, Septicemic, and Inflammatory Process Chickens. April 29, 2004, *BARC Poster Day*. Beltsville Agriculture Research Center, USDA-ARS.
10. **Yang, C.-C.**, K. Chao, Y. R. Chen and M. S. Kim. 2004. Application of multispectral imaging for identification of wholesome and systemically diseased chicken. *The American Society of Agricultural Engineers (ASAE), 2004 international meeting*, paper no. 04-3034.
11. **Yang, C.-C.**, K. Chao and Y. R. Chen. 2003. Development of multispectral imaging processing algorithms for food safety inspection on poultry carcasses. *The American Society of Agricultural Engineers (ASAE), 2003 international meeting*, paper no. 03-3054.

12. **Yang, C.-C.**, S. O. Prasher and J. Whalen. 2003. Neural network models for crop yield classification using hyperspectral imagery. *The American Society of Agricultural Engineers (ASAE), 2003 international meeting*, paper no. 03-1112.
13. Karimi, Y., S. O. Prasher, H. McNarin, R. B. Bonnell, P. Dutilleul, P. K. Goel, **C.-C. Yang** and Y. Uno. 2003. Hyperspectral remote sensing for discriminating water and nitrogen stresses in a corn field. *The American Society of Agricultural Engineers (ASAE), 2003 international meeting*, paper no. 03-1111.
14. **Yang, C.-C.** S. O. Prasher, S. Wang, S. H. Kim. C. S. Tan and C. Drury. 2002. Simulation of nitrate-N pollution in southern Ontario with DRAINMOD-N. *Northeast Agricultural and Biological Engineering Conference (NABEC), 2002 annual meeting*, paper no. 02-028.
15. **Yang, C.-C.**, S. O. Prasher and P. K. Goel. 2002. Differentiation of crop and weeds by decision tree analysis of multi-spectral data. *The American Society of Agricultural Engineers (ASAE), 2002 international meeting*, paper no. 02-1080.
16. **Yang, C.-C.**, S. O. Prasher and J. Whalen. 2002. Prediction of yields for corn and soybean with hyperspectral imagery. *The American Society of Agricultural Engineers (ASAE), 2002 international meeting*, paper no. 02-3139.
17. Wang, S., S. O. Prasher, **C.-C. Yang**, S. H. Kim, A. Madani, P. M. MacDonald and S. D. Robertson. 2002. Field validation of a mathematical model to estimate nitrate-nitrogen pollution from subsurface drained farmlands. *The American Society of Agricultural Engineers (ASAE), 2002 international meeting*, paper no. 02-2039.
18. Jutras, P., S. O. Prasher, **C.-C. Yang** and C. Hamel. 2002. Urban tree growth modeling with artificial neural network. *Proceedings of the 2002 International Joint Conference on Neural Networks, IJCNN'02, Honolulu, Hawaii, USA, May 12-17, 2002*: 1385-1389.
19. **Yang, C.-C.**, S. O. Prasher, J. Whalen and P. K. Goel. 2001. Application of data mining technology for hyperspectral imagery classification in agricultural fields. *The American Society of Agricultural Engineers (ASAE), 2001 international meeting*, paper no. 01-3116.
20. Goel, P. K., S. O. Prasher, R. M. Patel, J. A. Landry, A. A. Viau and **C.-C. Yang**. 2001. Weed and nitrogen stress detection in corn using airborne hyperspectral remote sensing. *The American Society of Agricultural Engineers (ASAE), 2001 international meeting*, paper no. 01-1199.
21. Salehi, F., S. O. Prasher, S. Amin, A. Madani, S. J. Jebelli, H. S. Ramaswamy, C. Tan, C. F. Drury and **C.-C. Yang**. 2001. Prediction of annual nitrate-N losses in drain outflows with artificial neural networks. *The American Society of Agricultural Engineers (ASAE), 2001 international meeting*, paper no. 01-3064.

22. **Yang, C.-C.**, S. O. Prasher, P. Enright, C. Madramootoo, M. Burgess, P. K. Goel and I. Callum. 2001. Application of data mining technology for image classification using remote sensing data. *The Canadian Society of Agricultural Engineering (CSAE), 2001 annual meeting with the Northeast Agricultural and Biological Engineering Conference (NABEC) and the Agricultural Institute of Canada (AIC)*, paper no. 01-611.
23. **Yang, C.-C.**, S. O. Prasher, P. K. Goel and R. Patel. 2001. Application of data mining for image classification in remote sensing. *Journée d'information scientifique et technique en génie agroalimentaire*, Saint-Hyacinthe, QC, Canada, March 21, 2001, 33-40.
24. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 2000. Development of a weed management system for precision farming. *Northeast Agricultural and Biological Engineering Conference (NABEC), 2000 annual meeting*, paper no. 2031.
25. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 2000. Applications of artificial neural networks to plant recognition in the field. *The American Society of Agricultural Engineers (ASAE), 2000 international meeting*, paper no. 00-3054.
26. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1999. Development of weed maps in corn fields for precision farming. *The American Society of Agricultural Engineers (ASAE), 1999 international meeting*, paper no. 99-3044.
27. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1999. Weed recognition in precision farming. *The American Society of Agricultural Engineers (ASAE), 1999 international meeting*, paper no. 99-3115.
28. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1999. Use of artificial neural networks to recognize weeds in a corn field. *Journée d'information scientifique et technique en génie agroalimentaire*, Saint-Hyacinthe, QC, Canada, March 3, 1999, 60-65.
29. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1998. Application of artificial neural networks to image recognition in precision farming. *The American Society of Agricultural Engineers (ASAE), 1998 international meeting*, paper no. 98-3039.
30. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1998. Application of image processing and weed recognition in precision farming. *Northeast Agricultural and Biological Engineering Conference (NABEC), 1998 annual meeting*, paper no. 9825.
31. **Yang, C.-C.**, S. O. Prasher and C. S. Tan. 1998. An artificial neural network model for water table management system. *Drainage in the 21st Century: Food Production and the Environment. Proceedings of the 7th Annual Drainage Symposium*, Orlando, FL, USA, March 8-10, 1998, p. 250-257.

32. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1997. Application of machine vision and artificial neural networks in precision farming. *The American Society of Agricultural Engineers (ASAE), 1997 international meeting*, paper no. 97-3107.
33. **Yang, C.-C.** and S. O. Prasher. 1997. Application of precision farming. *CSAE Conference Proceedings*, volume A, Sherbrooke, QC, Canada, 1997. p. 71-80. Canadian Society of Agricultural Engineering.
34. **Yang, C.-C.**, S. O. Prasher and J. A. Landry. 1997. The use of information technologies in precision farming. *CSAE Conference Proceedings*, volume A, Sherbrooke, QC, Canada, 1997. p. 562-571. Canadian Society of Agricultural Engineering.
35. **Yang, C.-C.**, S. O. Prasher and S. Sreekanth. 1996. An artificial neural network model for pesticide fate and transport. *The American Society of Agricultural Engineers (ASAE), 1996 international meeting*, paper no. 96-2025.
36. **Yang, C.-C.**, S. O. Prasher, R. Lacroix, S. Sreekanth, N. K. Patni and L. Masse. 1996. An artificial neural network model for the simulation of water-table depths and drain outflows. *Proceedings of the 49th Annual Conference of the Canadian Water Resources Association*, Quebec City, June 26-28, 1996: 225-239.
37. **Yang, C.-C.**, R. Lacroix, and S. O. Prasher. 1996. The use of back-propagation in neural networks for the simulation and analyses of time-series data in subsurface drainage systems. *Proceedings of Computers in Agriculture*, Cancun, Mexico, June 10-14, 1996: 941-949.
38. **Yang, C.-C.**, S. O. Prasher and R. Lacroix. 1996. Application of artificial neural networks in subsurface drainage system design. *Proceedings of Computers in Agriculture*, Cancun, Mexico, June 10-14, 1996: 932-940.
39. **Yang, C.-C.**, S. O. Prasher and R. Lacroix. 1995. Applications of artificial neural networks to land drainage engineering. *The Canadian Society of Agricultural Engineering (CSAE), 1995 annual meeting*, paper no. 95-610.