



IPR and Applications

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IPR and Applications to *Interactive Recognition System*

--- Security, Safer Transportation and Greener World

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Abstract:

This talk is concerned with fundamental aspects of Intelligent Pattern Recognition (IPR) and applications. It basically includes the following: Basic Concept of Automata, Grammars, Trees, Graphs and Languages. Ambiguity and its Importance, Brief Overview of Artificial Intelligence (AI), Brief Overview of Pattern Recognition (PR), What is Intelligent Pattern Recognition (IPR)? Interactive Pattern Recognition Concept, Importance of Measurement and Ambiguity, How it works, Modeling and Simulation, Basic Principles and Applications to Computer Vision, Security, Road Sign Design, Safer Traffic and Robot Driving with Vision, Ambiguous (Dangerous and Bad) design of Road Signs vs Unambiguous (Good) Road Signs, How to Disambiguate an Ambiguous Road Sign? and more Examples and Applications of Learning and Greener World using Computer Vision. Finally, some future research directions are discussed.

Intended Audience:

Scientists and engineers, with some computer science, artificial intelligence, pattern recognition, and/or image processing background or working experience.

Why this topic would be of interest to a substantial part of the audience:

Attendees can learn basic concept of “biometrics”, which is of growing interest and importance in recent years, and its applications in many fields, including engineering, scientific experiments, bio-medical imaging, pattern recognition, and homeland national security.

Length of the talk: 1 hour keynote, 3 hours tutorial, or seminar sequence

Evidence of teaching experience and evidence of scholarship in the area:

Preliminary versions of this talk have been successfully presented in various international conferences, and have received warm responses, including: CISCYN2013, Madrid, Spain, 2013, AMS2013, Hong Kong, 2013, MLDM 2013, WIPRA2013, New York, USA, ICCI2013, Chengdu, China, UKSim2014, Cambridge, UK, 2014, WCSC2014, U C Berkeley, USA, 2014, AMS2014, Taipei, Taiwan, and ICCI2014, Kunming, China.

<http://www.uksim.info/uksim2014/uksim2014.htm>
(2014, Cambridge, UK)

<http://www.wconsc-2014-berkeley.com/keynote.html>
(2014, U.C. Berkeley, USA)

Brief Biography of the Presenter

Prof. Patrick S.P. Wang, PhD. Fellow, IAPR, ISIBM, WASE, and IEEE & ISIBM Outstanding Achievement Awardee, is Tenured Full Professor, Northeastern University, USA, iCORE (Informatics Circle of Research Excellence) Visiting Professor, University of Calgary, Canada, Otto-Von-Guericke Distinguished Guest Professor, Magdeburg University, Germany, Zijiang Visiting Chair, ECNU, Shanghai, China, as well as honorary advisory professor of several key universities in China, including Sichuan University, Xiamen University, East China Normal University, Shanghai, and Guangxi Normal University, Guilin.

Prof. Wang received his BSEE from National Chiao Tung University (Jiaotong University), MSEE from National Taiwan University, MSICS from Georgia Institute of Technology, and PhD, Computer Science from Oregon State University.

Dr. Wang has published over 26 books, 200 technical papers, 3 USA/European Patents, in PR/AI/TV/Cybernetics/Imaging, and is currently founding Editor-in-Chief of *IJPRAI*

(*International Journal of Pattern Recognition and Artificial Intelligence*), and Book Series of *MPAI*, WSP. In addition to his technical interests, Dr. Wang also published a prose book, "*Harvard Meditation Melody*" 《哈佛冥想曲》 and many articles and poems regarding Du Fu and Li Bai's poems, Beethoven, Brahms, Mozart and Tchaikovsky's symphonies, and Bizet, Verdi, Puccini and Rossini's operas.

For further details, please contact:

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<http://ejournals.wspc.com.sg/ijprai/mkt/editorial.shtml>, **Founding Editor-in-Chief**
http://www.worldscibooks.com/series/smpai_series.shtml
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<http://www.dcs.warwick.ac.uk/~ctli/IJDCF.html> *Advisory Board*

Bibliography (selected from over 2 dozens of technical papers and books)

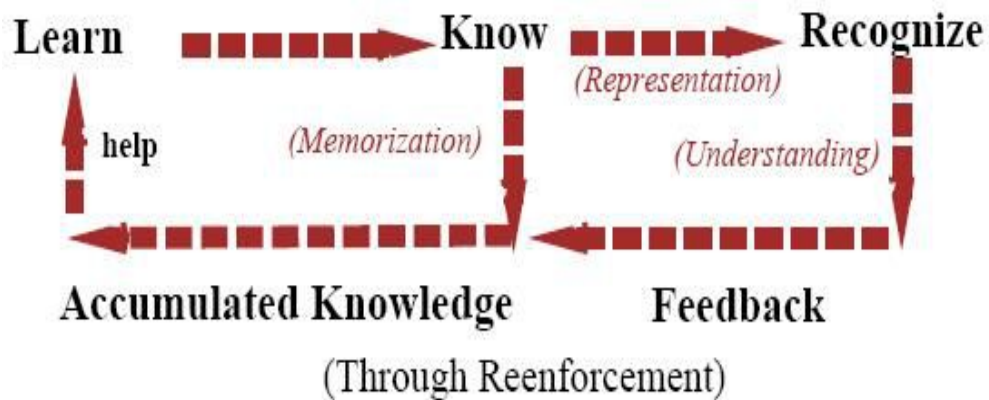
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Appendix: Some Highlighted Illustrations of the Presentation

Ambiguous and Dangerous Road Signs, need to be improved by Intelligent Pattern Recognition System

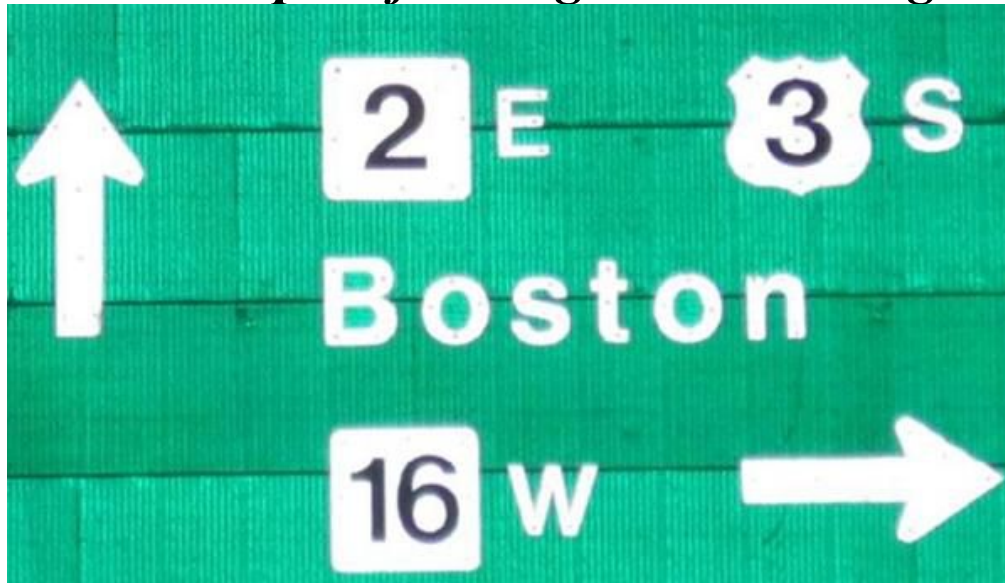


Learning, Knowledge, and Recognition

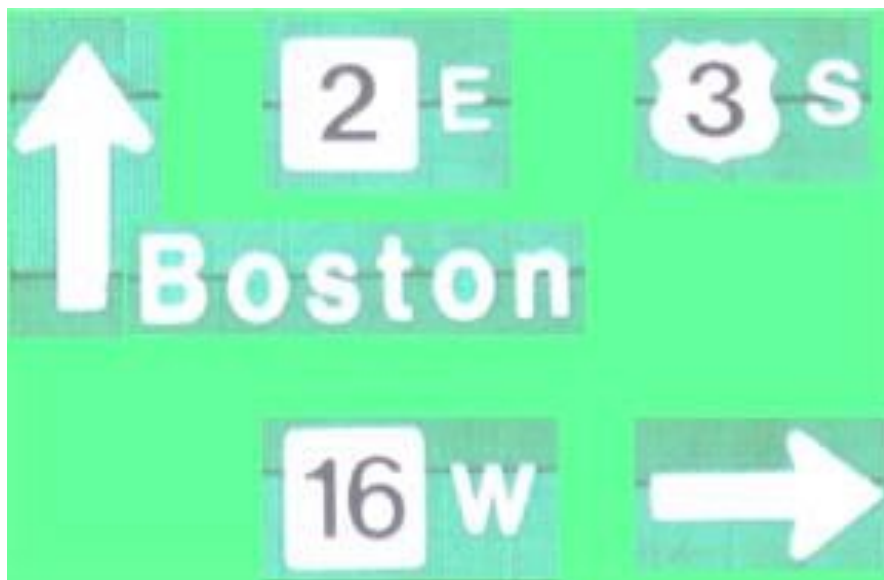


*Learning Cycle:
knowledge, recognition, understanding, representation*

An Example of Ambiguous Road Sign



One Method to Improve (Disambiguate) Road Sign



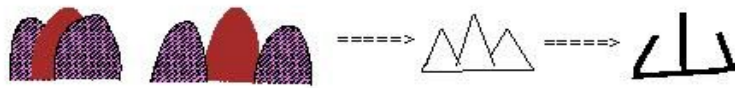
Another Way of Disambiguating Road Sign



An Illustration of Measurement Ambiguity



Su Dong-Po's poem (3D Object Recognition)



橫 看 成 嶺 側 成 峯
 遠 近 高 低 各 不 同
 不 識 廬 山 真 面 目
 只 緣 身 在 此 山 中

*Looking from one side, mountains, from the other side, ranges
 Far, near, high, low, all different
 I can hardly recognize the true face of the Lu Shan mountain
 Simply because I am in the middle of it*

Written by Su Dong-po, 11th Century, Translated by P. Wang, 1997

Interactive Recognition System with Iterative Learning

