RECOLLECTIONS OF CONVERSATIONS WITH PROFESSOR J.C. SIMON

[INVITED LECTURE]

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Extended Abstract

I was fortunate to have had numerous conversations with Professor J.C. Simon over the years and I will recount three of our recurring topics, all of them central to his work in OCR.

1. The importance of irregularities for feature selection. The volume "From Pixels to Features" edited by him (Amsterdam: North Holland, 1989) contains two papers:

- J-C. Simon "A Complementary Approach to Feature selection," pp. 229-236.
- T. Pavlidis and D. Lee "Residual Analysis for Feature Extraction," pp. 219-227.

The key idea in both papers is that what is predictable is not interesting. A smooth straight curve does not contain any information. Thus the shape I may be considered as a zero. L is distinguished because of its corner, the anomaly in its shape. Similarly the intersection of the two lines in X is the informative feature. One may argue that this approach is presumed by the old analysis of the difference between representation and discrimination, but there is more to the story. The traditional statistical analysis assumes that features have been already extracted; in order to apply the concept to feature extraction one must define what is the predictable basis.

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2. The importance of the engineering approach to solving problems as opposed to relying on a single methodology. The fields of image analysis and pattern recognition have been plagued by fashions: statistical pattern recognition, syntactic pattern recognition, graph grammars, connectionism, relaxation techniques, neural networks, fuzzy logic, hidden Markov models, etc. All of these techniques are quite valid and useful tools under certain conditions. Problems arise only when they are presented as panaceas that each can be used to solve all problems in the field. The engineering approach requires understanding the structure of the objects to be recognized and apply the appropriate combination of techniques. The following papers are example of such approaches that integrate different methodologies:

- S. Kahan, T. Pavlidis, and H. S. Baird, "On the Recognition of Printed Characters of Any Font And Size", IEEE Trans. on Pattern Analysis and Machine Intelligence, PAMI-9 (1987), pp. 274-288.
- J-C. Simon, "Off-Line Cursive Word Recognition" Proc. IEEE, vol. 80 (1992), pp. 1150-1161.

3. The importance of senior researchers being closely involved in the research to the point of writing code themselves. Both Professor Simon and myself had spent considerable in writing code to the bewilderment of our colleagues who thought that senior researchers should not write code themselves. Once he asked what should he tell such critics. I told him my "stock" reply to such criticism. Professors of surgery perform surgery with their own hands, no matter how senior they are; therefore it is only appropriate that professors of computer science should write their own programs. Would a person be willing to be treated by a physician who has been taught by professors who had never treated patients? Maybe the hiring of college graduates who have been taught by faculty who never did any programming themselves causes the sorry state of modern software. I will elaborate on this point in view of the advances in software tool development.