

Your Name: Robert Milewski

Your E-mail address: milewski@cedar.buffalo.edu

Your Dissertation Proposal Title:

"Handwriting Recognition and Analysis in the Context of Medical Forms and Medical Dictionaries"

Your Committee:

Chair:	Dr. Venu Govindaraju
Member 1:	Dr. Jian Pei
Member 2:	Dr. David Pierce

Your Dissertation Proposal Abstract:

*** This abstract is under construction - I will give you an updated version in the future ***

Handwriting recognition and analysis, in the context of a particular domain, is an important research problem with broad applications. For example, efficient collection of the New York State (NYS) Prehospital Care Report (PCR), and the population of a national emergency medical service database, will be of great importance to emergency preparedness, response and homeland security. Although flourishing researches have been conducted in the general field of handwriting recognition and analysis, the recognition and analysis in the context of a particular domain remains challenging for several reasons:

1. handwritten responses are very loosely constrained in terms of writing style
2. large lexicons (50,000+ entries in the medical domain)
3. writing often extends beyond form boundaries and overlaps other handwriting
4. data mining large volumes of heterogeneous and possibly unstructured data

In this research, we tackle the problem using medical forms and dictionaries as a sample application domain. We construct a hybrid technique using strategies in Machine Learning, Data Mining and Natural Language Processing to make the following contributions:

1. The design of an adaptive medical knowledge base (KB):
 - i) to assist existing handwriting recognition algorithms with complex data inputs.
 - ii) centralization and dissemination of handwritten emergency medical analysis.
2. The recognition of handwritten emergency medical forms:
 - i) healthcare quality assurance.
 - ii) higher quality communication between ambulances and hospitals during patient delivery.
 - iii) efficient digital communications to domestic medical, security, and intelligence organizations. Although the major focus is the medical domain, the general framework and techniques are extendible to many other application domains, such as tax and legal paperwork. The study of domain-oriented recognition and analysis opens the door towards effective information retrieval and dispersal.