The 20th Anniversary of the *IEEE Transactions on Pattern Analysis and Machine Intelligence*

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1 Introduction

Welcome to the "20th Anniversary Special Issue" of the *IEEE Transactions on Pattern Analysis and Machine Intelligence*! Over the past 20 years, there have been many important advances in the areas of interest to the PAMI community. In this issue, we are pleased to be able to present a collection of five survey papers that reflect on developments in selected areas. These five papers, of course, do not address all areas of interest to the PAMI community. In fact, we hope to have additional surveys appear in a future issue. *TPAMI* editorial policy strongly encourages authors of what might be termed "value added" survey papers in all major areas of interest to the PAMI community. By "value added" we mean to indicate a paper that gives the reader some value beyond that of a simple annotated bibliography or a plain survey. We look for an additional level of insight into what works and what doesn't, why, and what the open issues are.

2 Brief History of *TPAMI*

The *IEEE Transactions on Pattern Analysis and Machine Intelligence* (*TPAMI*) was started in January 1979 as a quarterly publication with an annual page budget of 440 pages, under the leadership of King Sun Fu. Tse-Yun Feng, then president of the IEEE Computer Society, wrote in the inaugural issue, "The first paper in this area published in *IEEE Transactions on Computers* dates back over two decades... the Computer Society has sponsored or participated in several conferences on pattern analysis and machine intelligence... the Computer Society is also an active member of the International Association for Pattern Recognition... There has been a lack of publications ... for papers in this broad area of interest. The publication of this quarterly is intended to meet such a demand." *TPAMI* quickly became a bimonthly in 1980 and the subscriptions jumped from 2,000 to 7,000 in the first three years. It reached a peak of over 10,000 in the late 1980s before settling down to the current level of approximately 7,500. *TPAMI* became a monthly in 1989 and reached its present size of 1,456 editorial pages in 1998.

Editorial direction and leadership to *TPAMI* has been provided by King Sun Fu (1979-1982), Theo Pavlidis (1982-1986), Steven L. Tanimoto (1986-1990), Anil K. Jain (1991-1994), and Rangachar Kasturi (1995-1998) during its first two decades. They were assisted by many outstanding individuals in various capacities such as advisory editor, associate editor, guest editor, and production editor. A list of associate editors is included at the end of this editorial.

Topics of papers published in *TPAMI*, as well as its declared scope, have gradually changed over the years to reflect the changes in research trends, as well as the introduction of other IEEE publications covering topics that were once covered in PAMI. The first issue of *TPAMI* listed topics such as speech analysis, natural language analysis, and inference systems in its scope. Soon, *TPAMI* established itself as the premier journal for papers in pattern recognition and computer vision. The early years of *TPAMI* also saw the debate concerning the imbalance between the PA and MI components. This continued for quite some time until *TPAMI* became established as the leading journal of our field.

One of the constant concerns for editors of *TPAMI* during the first two decades was the review/revision/publication cycle time. This is reflected by comments such as the following—"most common suggestion was that I should speed up the editorial process" in an editorial by Pavlidis in September 1982, "we will be working to expand the editorial board ... to reduce the time" in an editorial by Tanimoto in November 1986, "Two of the serious concerns ... are delays in the review... and the publication delays once a manuscript has been accepted" in an editorial by Jain in February 1991, and "I am concerned [about] our publication backlog" in an editorial by Kasturi in February 1996. We are fortunate that, as a result of many actions taken by the past editors and the cooperation of the entire PAMI community, this problem has finally been solved. In recent months, we have had papers appear in print in as short as six months from the time of submission! (See additional comments below.)

3 This 20th Anniversary Issue

The *IEEE Transactions on PAMI* has actually just completed its 21st year of publication. The concept for this special issue began before *TPAMI* had completed its 20th year, under Rangachar Kasturi's term as EIC. The natural constraints of editorial planning, authors' creative work, review, and production led to the first group of survey papers appearing in this issue. Due to constraints of scheduling and length, several additional survey papers recognizing this occasion should appear in another issue in the near future.

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The papers appearing in this special issue were meticulously and promptly reviewed by experts in leading research groups from around the world. Each paper received at least three reviews, and most received four reviews. We were quite impressed by the care that the reviewers put into their task and we thank them all for their efforts. The authors then carefully and promptly prepared revised papers based on the reviews. We hope that you will find each of these papers to be exciting and useful.

The first paper in this issue is "Statistical Pattern Recognition: A Review" authored by Anil Jain, Bob Duin, and Jianchang Mao. Anil Jain is, of course, one of the leading figures in pattern recognition research and is a past EIC of *TPAMI*. Bob Duin is similarly a leading figure in pattern recognition and serves as Electronic Annexes Editor of the journal *Pattern Recognition Letters*. Jianchang Mao is an already well-recognized younger researcher in pattern analysis, now with the IBM Almaden Research Labs.

The next paper is "Twenty Years of Document Image Analysis in PAMI" by George Nagy. George Nagy is an active and leading senior figure in the areas of document image analysis and pattern recognition.

The third paper is "On-Line and Off-Line Handwriting Recognition: A Comprehensive Survey" by Rejean Plamondon and Sargur Srihari. Professors Plamondon and Srihari are both long-established experts in this field, concentrating on on-line and off-line recognition, respectively.

The fourth paper is "Medical Image Analysis: Progress over Two Decades and Challenges Ahead" by James Duncan and Nicolas Ayache. Jim and Nic are, of course, well-known to those in the medical image analysis community. They also happen to be the editors of a recent new journal titled *Medical Image Analysis*.

The fifth paper is "Looking at People: Sensing for Ubiquitous and Wearable Computing" by Alex Pentland. This paper deals with a relatively newer area than the other papers and the area may be controversial to some. The paper gives good motivation and insight into the different research activities in this broad area.

4 Current State of *TPAMI*

4.1 Timely Review Cycle

Currently, it is quite possible for good, well-written papers to appear in print within a year of being received for review. Recently, we have even had papers appear in as short as six months! The September 1999 issue contains articles submitted in March 1999, December 1998, April 1999, November 1998, and October 1998. The October 1999 issue contains articles submitted in February 1999, March 1999, October 1998, and April 1999 (two). The November 1999 issue contains articles submitted in December 1998 (two) and February 1999. The December 1999 issue contains articles submitted in December 1998, January 1999, and May 1999. Of course, not all papers move through the review and publication process this promptly. Papers that require a major revision and second round of review before being accepted naturally take longer to appear. This is where authors can do their part to help ensure timely publication. Papers that lack a precise statement of their contribution relative to the current state of the art, that lack a careful literature review, or that have a poorly thought-out logical structure, quite often have to go through a second round of review. All of these are factors are under the author's control. Other things being equal, more significant results and better written papers generally make it through the review cycle faster. And, while many papers are now receiving the benefit of a prompt review cycle, we are still working hard to reduce the frequency of outliers in this respect.

4.2 Electronic Appendices

It is now possible to have the data files and algorithm implementations appear as appendices to the electronic version of a paper that appears in the Computer Society digital library. These appendices are currently accessible even if you do not subscribe to the electronic version of *TPAMI*. Check out the April and July 1999 issues of *TPAMI* at www.computer.org/tpami/tp1999/ for examples of this. We hope to expand this feature of the journal in order to better archive the experimental artifacts that are needed for future researchers to be able to replicate and compare to past work.

4.3 Reputation for Quality

TPAMI is widely acknowledged as the premier journal in its areas of coverage. This subjective reputation is backed up by objective studies such as the impact factor rankings in ISI's *Journal Citations Report*. This is made possible only by the continued efforts of authors, reviewers, and associate editors who serve the community in their dedicated pursuit of high quality. On behalf of the community, we sincerely thank all those who have contributed to the success of *TPAMI* over the last two decades.

5 List of Associate Editors of *TPAMI* in Alphabetical Order

A

Narendra Ahuja
J.K. Aggarwal
Yiannis Aloimonos
Harry C. Andrews

B

Henry S. Baird
Ruzena Bajcsy
J. Ross Beveridge
Thomas O. Binford
Michael J. Black
Andrew Blake
Ruud M. Bolle
Terrance E. Boult
Charles A. Bouman
Kevin Bowyer
Kim Boyer
Christopher Brown
Bruce Buchanan

C

Terrence Caelli
Rama Chellappa
Y.T. Chien
Roland Chin
Henrik I. Christensen
William J. Clancey
Jonathan Connell
Thomas M. Cover

D

John Daugman
Thomas L. Dean
Edward J. Delp
Sven J. Dickinson
Its'hak (Tsiki) Dinstein
Byron E. Dom
Dov Dori
Robert Duin
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Stanley Dunn
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Jan-Olof Eklundh

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Olivier Faugeras
Patrick Flynn
Herbert Freeman
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H

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J

David Jacobs
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Aravind K. Joshi

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Ramakant Nevatia

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Shmuel Peleg
Rosalind W. Picard
Rejean Plamondon
Ken Preston, JR.

R

Raj Reddy
Azriel Rosenfeld

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Ishwar Sethi
Mubarak Shah
Rajeev Sharma
Linda Shapiro
Amnon Shashua
Yoshiaki Shirai
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Jack Sklansky
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Yuan-Fang Wang
Michael S. Watanabe
Andrew Webb
Bonnie L. Webber
George M. White
Jared J. Wolf
Lawrence B. Wolff
Robert J. Woodham

Y

Tzay Y. Young

Z

Steven W. Zucker