MODELING, IDENTIFICATION AND CONTROL

A Nordic Open Access Research Journal

ISSN 0332-7353 (Printed version) ISSN 1890-1328 (Electronic version)

Sponsoring Organizations

Norwegian Society of Automatic Control (NFA), Kristiansand - Lars A. Ekornsæter.
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Publisher

Norwegian Society of Automatic Control, Kristiansand, Norway.

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Website: http://www.mic-journal.no
E-mail: editor@mic-journal.no

Publication Schedule and Print-On-Demand

Published quarterly. Previous issues available as print-on-demand and at rates stated at the website.

MIC STATISTICS DECEMBER 2009

OVERALL STATISTICS SINCE 1980 INCLUDING THE CURRENT ISSUE

Total Number of Articles	451
Number of Unique Authors	472
Number of Unique Research Institutions	115
Number of Authors with More than 1 Article	121
Number of Authors with More than 2 Articles	63

TOP AUTHORS

Author	Contributions
1. Jens G. Balchen 1980-2003	50
2. Olav Egeland 1984-2007	31
3. Thor Inge Fossen 1988-2009	29
4. Bjarne A. Foss 1983-2007	27
5. David Di Ruscio 1989-2009	15
6. Rolf Henriksen 1980-2000	14
7. Sigurd Skogestad 1991-2008	14
8. Tor A. Johansen 1992-2008	10
9. B. Lie, K.M. Mjelde	9
10. K.Y. Pettersen, M. Hovd	8

TOP INSTITUTIONS

Author	Contributions
NTNU, ITK	190
SINTEF	58
NTNU, Other Dep.	34
Telemark (HiT)	28
IFE	23
NTNU, Chem. Eng.	17
ABB	14
Norsk Hydro	14
FFI	13
CMR, CeSOS	11

TOP DOWNLOADS 16.12.2009

Author	DOI
1. H.R. Karimi	mic.2009.1.3
2. T. Perez and T.I. Fossen	mic.2009.1.1
3. C. Holden et al.	mic.2007.4.1
4. M. Breivik et al.	mic.2008.4.2
4. T. Perez and T.I. Fossen	mic.2008.3.2
6. S. Skogestad	mic.1997.3.1
7. D. Sui et al.	mic.2009.1.2
7. J.G. Balchen et al.	mic.1980.3.1
9. T. Lid and S. Skogestad	mic.2008.4.1
10. E.M.B. Aske et al.	mic.2008.3.3
10. R. Skjetne et al.	mic.2004.1.1

TOP CITED ARTICLES

ISI citations: Author	DOI
41: J.G. Balchen et al.	mic.1980.3.1
40: T. Larsson and S. Skogestad	mic.2000.4.2
32: T.A. Johansen and B.A. Foss	mic.1992.1.3
25: D. Kugiumtzis et al.	mic.1994.4.1
23: S. Skogestad	mic.1997.3.1
20: S. Grimsen et al.	mic.1987.1.8
19. D. Slagstad et al.	mic.1990.4.1
19. W. Ebenhöh	mic.1980.2.2
18. B. Lillekjendlie et al.	mic.1994.4.2
17. T. Ozanian	mic.1995.2.1
17. Z. Kowalik	mic.1981.4.2
17. D. Slagstad	mic.1981.3.1

WEBSITE STATISTICS

Month	PL	UV	FV	RV	DOI 1	DOI 2	ISI 1	ISI 2
Dec 2009	1702	593	429	164	242	0.55	878	1.98
Nov 2009	1545	666	538	128	234	0.53		
Oct 2009	1950	709	574	135	233	0.53		
Sep 2009	1497	477	338	139	231	0.53		
Aug 2009	1037	285	214	71	217	0.50		
July 2009	1209	344	293	51	196	0.45		
June 2009	1474	446	360	86				
May 2009	2416	474	337	137				
Apr 2009	1275	311	196	115				
March 2009	2275	354	194	160				
Feb 2009	812	52	27	25				

PL	Page Loads
UV	Unique Visitors
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DOI 1	Number of DOI forward links
DOI 2	DOI forward links per article
ISI 1	Number of ISI citations
ISI 2	ISI citations per article

EDITORIAL

In this issue we celebrate the 30th year anniversary of the journal MIC. In the very first issue from 1980, the founder and editor professor Jens Glad Balchen wrote: *"The idea of establishing MIC is close to ten years old in Norway, but the final decision to go ahead was only made in 1978. Norwegian research groups have been relatively active in the fields of modeling, identification and control for nearly 30 years, and have contributed to the generation of basic knowledge and to the application of theoretical ideas in practical life."*

In this anniversary issue we go all the way back to the beginning of our research field in Norway, to the early 1950s, in the first article by Stig Kvaal. This article tells the fascinating story of the Norwegian automation pioneers and servo enthusiasts, which was the same group of enthusiasts who later took the initiative to establish MIC. Many of the challenges faced by these pioneers in the 1950s and 1960s are the same today, not least when it comes to collaboration between research institutions and the industry to achieve true innovation and industrialization. But, even if our research projects and publications are important, we should never forget one of the final conclusions in the article by Kvaal: educating and filling the nation with skilled automation engineers was probably the most significant long-term contribution of the servo enthusiasts.

The second article in the anniversary issue is a tribute to the late editor and founder of MIC Jens Glad Balchen (1926-2009), who has left a lasting impact on our field. He was responsible for making the Department of Engineering Cybernetics at NTNU in Trondheim the national engine for cybernetics research and education in Norway. Through his focus on applications, he also contributed to the establishment of many key Norwegian high-tech companies. His colorful research projects involved everything from process control and dynamic positioning of ships to fish control and lobster farming. We hope that his story can serve as a source of inspiration for everyone involved in the exciting and important field of control engineering.

The third and fourth articles are summaries of recent activities at the Department of Engineering Cybernetics at NTNU and the Department of Electrical Engineering, Information Technology and Cybernetics at Telemark University College. The Department of Engineering Cybernetics at NTNU has been the most active contributor to MIC in the past, with authors and co-authors on more than 40% of all the articles. Telemark University College has also been a very important contributor in the past with about 6% of all published articles. The revitalisation of the MIC journal in 2009 coincides with the establishment of new M.Sc. and Ph.D. programs related to modeling, identification and control at the regional colleges and universities in Norway. Perhaps the MIC journal can play the same role for these institutions as it did for the Department of Engineering Cybernetics in the 1980s? At the same time, the journal strongly encourages contributions from the industry and the research institutes to properly balance theory and practice. The editorial team also encourages contributions from all the Nordic countries as MIC expands from mostly focusing on Norwegian-affiliated research to becoming a channel for results from the entire Nordic region.

The fifth article comes from another very important contributor to MIC, the Department of Chemical Engineering at NTNU. The contributions to MIC started in 1983 by professor Terje Hertzberg and have later continued through professor Sigurd Skogestad and his Ph.D. students. These contributions are characterised by an above average level of citations. Currently two of the top five cited MIC articles come from this department. In this anniversary issue professor Skogestad writes: *"Feedback is a very powerful tool, but, maybe because of its simplicity, it often gets overlooked and forgotten, and it seems that its advantages need to be rediscovered every 20 years or so."* The anti-slug control example presented in the paper is particularly impressive.

The sixth and seventh articles are contributions from the industry. Xstrata Nikkelverk in Kristiansand celebrates its 100th year anniversary in 2010. It was therefore natural to invite this world-leader in the process industries to write about the *Past, Present and Future of Process Control* at the company. As already mentioned, starting from 2009 MIC also accepts papers from the other Nordic countries and we are very happy to include an article about robot control at ABB Robotics in Västerås, Sweden. ABB Robotics was the first company in the world to launch an electrical industrial robot in 1974, and also the first robot manufacturer to

implement model-based robot control. It is interesting to note that both of these papers, despite originating from different industries, predict a significantly increased level of instrumentation and sensor-based control. As the measurement possibilities and level of instrumentation increase, the arguments in the article by Skogestad should be kept in mind: careful selection of the measured variables combined with feedback controllers can often be both simpler and better than more sophisticated feedforward-based solutions.

It is also interesting to compare the *dream of the fully automated factory* and the *central controller* described in the article by Kvaal and the actual implementation of the distributed control system at Xstrata Nikkelverk. In many ways, we may claim that the *central controller* problem of the 1950s has been solved, although by a distributed architecture rather than by replacement of all local controllers, which was the original approach in the 1950s.

The anniversary issue is finally concluded with an article about *Trends in Research and Publication*. While it is important to remember and learn from our *servo engineering* history, new trends and technologies are most likely to influence the development of both our field of engineering as a whole and also the MIC journal in particular during the next decade. New methods of research collaboration and information-sharing through the Internet are set to bring about fundamental changes to the way research is being done today. We will hear more about the terms *Science 2.0* and *Open Access* in the coming years. By recently becoming an open access journal, MIC aims to be at the forefront of this development.

Finally, the editorial team wants to thank all the authors who have contributed with articles for this special anniversary issue. We would also like to take the opportunity to encourage both new and old contributors to help make MIC a leading journal within the topics of modeling, identification and control for the next decades!

Geir Hovland
Editor

Morten Breivik
Associate Editor

GUEST EDITORIAL

No comment about the thirtieth anniversary could omit mentioning Jens Balchen. Indeed I have known him personally since MIC was −20 years old.

There were many coincidences in our lives. My father, like his, studied Electrical Engineering (mine at TH Karlsruhe, in Germany). My father was also involved with Siemens (in Berlin and then in Cairo). We have nearly met at MIT in 1951 — Jens leaving to return to Norway not to be dragged into the Korean war, I arriving as a student with a freshly awarded "deferment" necessary to accomplish the same objective. My first exposure to servomechanisms, in 1951, was also from the Brown and Campbell book, via an earlier interest in the Laplace transform ("*you should study servomechanisms, they use a lot of Laplace transforms there*"). And a couple of years later I was working at the MIT Servomechanisms Laboratory. Like Jens. I was present at the famous (0-th IFAC) conference, September 1956, in Heidelberg, a city where I happened to have lived many happy days a few years earlier. We probably did not run across each other there and then, but, like Jens, I was already a fanatic for research. My zeroth-born child (Kalman filtering) was conceived about the time Jens' first-born was born. We were (and remained) both enthusiastic about abolishing slavery in its various forms, especially the kind implemented via political or bureaucratic ideologies.

I think I first met Jens at a party at Berkeley in 1961. We stayed in touch ever since. I visited Norway, several times, mostly at the invitation of Jens. The last time was in 1998, when both of us were newly "officially" retired, and Jens engineered a marvelous trip for us, by car, from Oslo, ending with my lectures in Trondheim. This was the last time I saw Jens, at the farewell dinner before flying back to Oslo. The dinner was held in the same place (near the train station) and the same time where thirty-four years earlier Norbert Wiener was fated to take the midnight train to Stockholm. At the dinner we kept joking that I hoped to come again many times to Trondheim but only if he got me an airplane ticket for the return trip. It is very sad that Jens took the midnight train before me.

Our public research paths were divergent already in the 1960's but our private friendship was steady and grew. When MIC started in 1980, we were both in total agreement that IDENTIFICATION, broadly interpreted, was one of the most important, indeed *the* most important, scientific problem still slowing or blocking our engineering vision of a better (and happier) world through automatic control. The last thirty years most of my work, highly theoretical, has been focused on the problematique of identification. I still hope to publish the big paper in MIC. And, looking back, it would seem that physics, atomic physics especially, would have benefited from modern knowledge on identification. But those physicists somehow managed to muddle through that problem already a hundred years ago. There is still hope for the future, however. At the moment the economists are muddling in their ineffective ways, unable to separate ideological politics from science, and the biologists have barely begun...

I wish everyone associated with MIC a very successful next thirty years.

Rudolf Kalman, ETH Zurich