

機構 與 機器 設計

中華民國八十一年七月

行政院新聞局出版登記證

局版台誌字第9132號

7-81

本期要目

- 淺談德國機器(械)設計教學概況 —
以 Braunschweig 理工大學為例 \ 蔡錫鈺
- 大學機械設計及相關課程之完整性 \ 劉正良
- 研討會消息

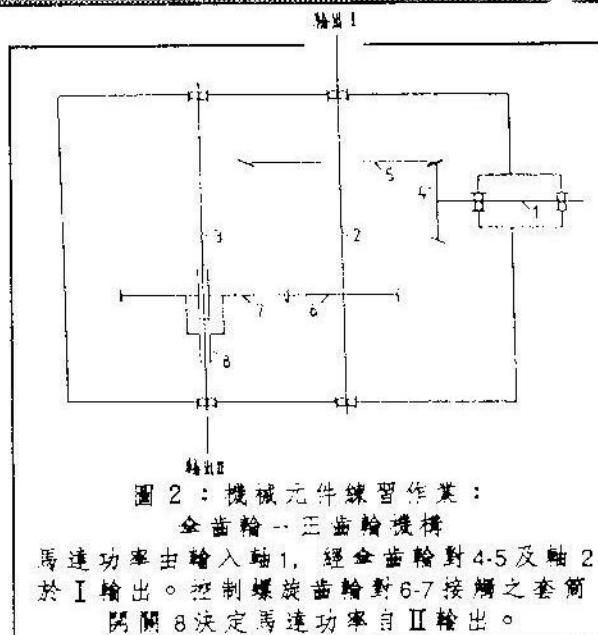
中華民國機構與機器原理學會
高雄市郵政第59-80號信箱
TAIWAN 80424, R.O.C.

臺灣機械工程學會

卷
第

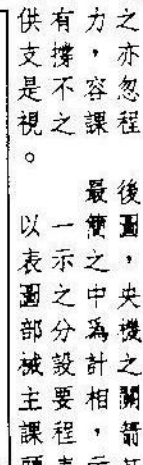
圖 1：設計組課程表，其中數字表示演講課+練習課之時數

近縮及整零要除實計有集皆算部讓。系為過決調輔希思設計課計
最壓，成要的，用設所皆業計計，圖械綱考解強之也覆的設習設
以式泵完重少式使導，)作及設主計機大思，再用，反己的練種
。塞塞要、缺方的指法Ⅲ有答中為設有程輯法一常外的自練。各
計活活定書可行式來方一所簡其份出所課邏方授計驟間於熟)論
設：式一算不進公理試Ⅰ是：。部畫是。體化教設步之屬位作計
成爲轉不計是課算助考件提份)要再。3修其系授方設際一養的小
來題，學表表練要教的械之三小的後[註選及之同介體實立培界生
2)計軸。求件，重由別機試分三構算”、具案如引整與建要業學
圖些床機是及類一，較圖加式計單單原的助決擇，式象學不於帶
考這磨輪但以圖解外比製參形設簡簡計段輔解選點模抽讓而屬理
參，齒，圖製講明。程。試，件的設階的求與重析在而，是助。
(例構正圖合程一說習工完考)一要械業計算估的分生進式這學式
圖爲機一計組工統題練(考。時以必機專設，評課、學，模(教模機
構屆動輪設、與教習的程次格小常做”在法紹之門具養力考師過析”
結一傳齒的圖。助及題課一及三通生。生方介案這工培能思程透分
理的機衆套件求由例習的中須(份學。學：程方，助望考計工亦之
，包整)法習小半修鋸一鋸公條從小表成每由的做



計二學直爲生一。劃而零設其學分相設之之無視學的心計、驗，合學來形格略計習系做域的備表實年約用數造資策設練域所的境界設求或半有採係上之授場器計機下計業器需機是需不權學有、與的德指到自的寫源通段德之美具品因。中耶教觸來要，將間階因績在由產此紹程，助接是需圖得時業。成點（做在介課識在正不驗計亦業專績業重展人，步述認，真若實設時作在成畢，發責等一上步前爲常爲出個（的算授及員）進把初之定通內畫，整分分計教劃門介做們的文認想所要書。學學其計規部領不我計論可構究只算來9個以。者與點教多應，大片或皆設元則務易是能設品發務而果設業也計研不計出合97處）筆形幾就授務例當影，機械紹實不就與業產研實係如對畢計設是生、造約之此示情人1.教實爲相投籍錄灣灣機介具集足收工、界及關生寫設類就學表製重制，表課個院）業理接學在件這，且件備比分制對

計已應計機中程詳計之。課跟製密提
設自程設套廠造周設低。關如械精性
械生課定整工製更器最。相，機、造
機學一擬出習之，機達。之程、習製
授由此行繪實件時事亦。要課習實可
開要。自到的零計從程。主關實造之
應是驗生計校對設可課。較相廠製計
，即經學設學但來則關。為之工、設
四，之由，到不未，相。者要，對
大者步期學則則在此及。舉次之規均
了習初學所期，能如計。列為言程，
到實取上日學器具。設。所較例製等
。謂獲，往下機，題械。上有舉、等
落所以期用。出解問機。以尚。理機
段。學，學應止做了造而。者，者原具
一程做兩並為圖分製，矣然外關造工
告課去下，置藍充慮作性當另有製、
此習手上目藍依能考工整。造、測
至實動分題器，序的的完。程製造量

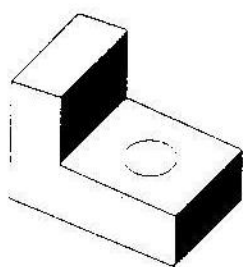


研 討 會 消 息

- 各研討會詳情請閱附件

Call for Papers

Montreal, Canada,
May 19-21, 1993



SOLID MODELING '93

SECOND ACM/IEEE SYMPOSIUM ON SOLID MODELING AND APPLICATIONS

Conference Co-Chairs

Joshua Turner, Rensselaer
Jarek Rossignac, IBM
George Allen, EDS

Conference Coordinator

Mary Johnson, Rensselaer

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Tony Woo, University of Michigan
John Woodwark, Computer-Aided Design
Michael Wozny, Rensselaer

This symposium provides an international forum for the exchange of recent research and practical results in all areas and applications of solid modeling. The first symposium in this series, held in June 1991, in Austin, Texas, brought together the the most prominent researchers, key practitioners, and numerous students in this rapidly growing field. Emphasis is on the impact of solid modeling in design and manufacturing, including such topics as

- Geometric and topological domain
- Representation conversion
- Blends, sweeps, offsets
- Algorithmic complexity
- Geometric reasoning
- Interference/clearance analysis
- Hardware support
- User interaction techniques
- Feature-based modeling
- Constraint-based design
- Parametric design
- Assembly modeling
- Product modeling
- Product data exchange
- Manufacturing planning
- Engineering analysis

Papers should be at most 6000 words in length, and should present previously unpublished original results. Please submit abstracts and papers to Mary Johnson at the address listed below. The schedule for submissions is as follows:

September 1, 1992: Abstract due (150-300 words)

October 15, 1992: Full papers due (6 copies)

January 7, 1993: Notice of acceptance & reviewers' comments

February 7, 1993: Final camera-ready papers due

To receive an advance program, or obtain further information, contact

Mary Johnson
Design Research Center, CII 7015
Rensselaer Polytechnic Institute
Troy, NY 12180-3590

Phone: 518-276-6751
FAX: 518-276-2702
E-mail: mjohnson@rdrc.rpi.edu



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CALL FOR PARTICIPATION

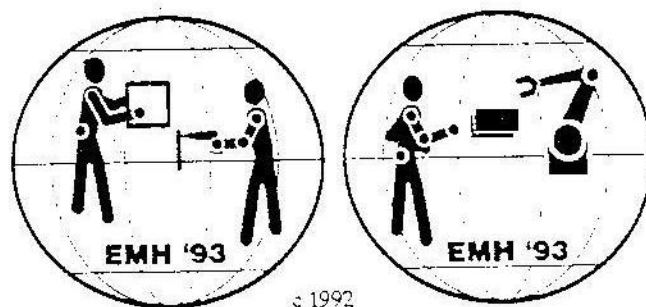
The International Ergonomics Association (IEA) organizes conferences in areas of importance to the world society

Announcing IEA World Conference '93 on

ERGONOMICS of Materials Handling

Health, Safety and Productivity Aspects of
Repetitive Manual and Automated Materials
Handling and Tool Manipulation at Work

14-18 June 1993
Warsaw, POLAND



© 1992

Organized by

Industrial Ergonomics Technical Group
of the Science & Technology Committee,
International Ergonomics Association

In cooperation with Polish Ergonomics Society and
Central Institute for Labour Protection, Warsaw, Poland

Under the Patronage of
The Ministry of Labour and Social Policy, Poland

Objectives

You are cordially invited to participate in the interdisciplinary IEA World Conference on Ergonomics of Materials Handling '93. The main objective of this comprehensive Conference is to provide an international forum to advance scientific knowledge about the impact of repetitive manual and automated load handling and tool manipulation on human health, comfort and safety. The consequences of the above for health care costs, prevention needs, industrial competitiveness and productivity, and quality of working life around the world will be addressed.

The Conference goals will be accomplished through invited plenary addresses, parallel technical sessions, poster sessions, tutorials and workshops, and symposia.

Conference Sponsors

- International Labour Organization, Switzerland
- National Institute for Occupational Safety & Health, USA
- Human Factors Society, USA
- International Foundation for Industrial Ergonomics and Safety Research
- Polish Society of Biomechanics
- Technical Committee on Man-Machine Systems of the International Federation for Theory of Machines and Mechanisms
- Committee for Scientific Research, Poland
- The Ministry of Health and Social Welfare, Poland
- Ergonomics Committee, Polish Academy of Science
- The Ministry of Industry and Trade, Poland
- Organization for Technical Affairs (NOT), Poland
- Technical University of Warsaw, Poland

Conference Leadership

Honorary Co-Chairmen	Prof. M. M. Ayoub, U.S.A. Dr. I. Kuorinka, Finland
General Chairman	Prof. W. Karwowski, U.S.A.
National Co-Chairmen	USA: Prof. J. L. Smith Poland: Prof. L. Pacholski
Chairman, Scientific Advisory Board	Prof. K. H. E. Kroemer, U.S.A.
Technical Program Chairman	Prof. W. S. Marras, U.S.A.
Local Coordinators in Poland	Prof. D. Koradecka, Warsaw Prof. T. Marek, Krakow

Scope

The Conference will aim to stimulate an interdisciplinary review of current research and applications, and future directions in three main areas of concern to the world society:

- 1) Manual Materials Handling & Occupational Injuries
- 2) Prevention of Cumulative Trauma Disorders at Work, and
- 3) Human Factors Aspects of Automated Materials Handling.

The Conference will review the current status and trends in theoretical research and practice of preventing repetitive strain injuries, including low-back problems and other cumulative trauma disorders due to manual load handling and tool manipulation tasks. The human factors issues and safety aspects of automated materials handling in both manufacturing and service industries will also be discussed.

Topics of Interest

The main conference themes will focus on, but are not limited to, the following topics relevant to *Human Factors of Manual & Automated Materials Handling*:

- Anthropometry and Workstation Design
- Biomechanics of Low Back
- Posture and Postural Discomfort
- Physiological Limits of Manual Work
- Quantification of Repetitive Tasks
- Prevention of Repetitive Trauma Disorders
- Epidemiological Issues
- Medical Intervention & Rehabilitation Efforts
- Training and Strength Testing
- Safety and Accident Prevention
- Engineering Job Analysis & Design
- Productivity Issues and Standardization Efforts
- Social and Legal Concerns
- Labor-Management Relations
- Organizational Design & Management
- Cognitive Engineering Aspects
- Ergonomics Programs for Industry
- Participatory Ergonomics

Future needs for research and industrial applications, current trends in government policies, regulations and standards, and labor-management relations will also be a major part of the Conference agenda.

Application Areas

The main areas of interest include prevention of musculoskeletal disorders and improving working conditions in:

- * Manufacturing
- * Construction
- * Warehousing
- * Meat processing
- * Apparel manufacturing
- * Retail
- * Banking
- * Hospital care
- * Post office operations
- * Transportation
- * Mining
- * Agriculture
- * Forestry
- * Oil exploration
- * Chemical processes
- * Other service-related industries

Proposals for Participation

All proposals submitted for consideration by the Program Committee should conform to the following general requirement. The first page should provide a title, names, mailing addresses, telephone and telefax numbers and electronic mail information (if available) for all authors.

Prospective authors should consider the three different modes of presentation, such as oral presentation, poster or panel discussion, when submitting their proposals for review.

1. Technical Presentations

An abstract of 300-500 words should include objectives, methods, results and their significance, and conclusions.

2. Poster Sessions

Poster sessions are aimed to present the latest developments and state-of-the-art in Conference topics through direct interaction between the authors and participants. An abstract of 300-words is required.

3. Panel discussions, workshops and tutorials

An abstract of 500 words should state the objective, educational content, intended target audience, and include a biosketch of the presenter(s).

Submission Deadlines

Since numerous proposals are expected, the Organizers encourage all prospective authors to send their proposals for evaluation as soon as possible.

All proposals will be reviewed by members of the International Scientific Advisory Board. In order to facilitate planning for the Conference, acceptance decision will be made within thirty days from the receipt of each submission.

Therefore, proposals for presentation at the Conference are now welcome, and can be submitted at any time, but before the below noted deadline.

Latest receipt of proposals for:

- | | |
|----------------------------------|-------------------|
| * Technical papers | September 1, 1992 |
| * Workshops, tutorials & posters | October 1, 1992 |

Latest notification of review outcome	October 1, 1992
Receipt of accepted papers:	December 15, 1992

Proposals for Technical Papers should be submitted to:

Prof. W. S. Marras, Technical Program Chair, Industrial and Systems Engineering Department, Ohio State University, Columbus, OH 43210, USA, Tel +1 (614) 292-6670, Fax +1 (614) 292-7852. Electronic mail: marras@CCL2.Ohio-state.edu

All other proposals, including those Special Sessions, Workshops, Tutorials & Posters should be submitted to Prof. W. Karwowski at the address given below.

Conference Secretariat

Prof. W. Karwowski, General Conference Chair, Center for Industrial Ergonomics, University of Louisville, Louisville, KY 40292, U.S.A., Tel +1 (502) 588-7173, Fax +1 (502) 588-7397; Electronic mail: wkarwa3@ulkyvm.bitnet

Conference Proceedings

The accepted papers and poster presentations will be published in a book form. Camera-ready paper for typing and instructions for preparation of manuscripts will be sent to all authors by October 15, 1992.

International Scientific Advisory Board

Chairman: K. H. E. Kroemer, U.S.A.

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K. Landau, Germany	S. Sugiyama, Japan
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S. Legg, New Zealand	J. Wilson, U.K.
H. Luczak, Germany	A. Wisner, France
	K. Vanwonterghem, Belgium
	A. Zankovsky, Russia

Student Volunteers

Student volunteers are sought to help in on-site organizational efforts in exchange for a waiver of registration fees. For more information, please contact the Conference Secretariat.

Request for Cooperation

The Conference organizers welcome inquiries and offers of cooperation and help in organizing efforts from industry, labour organizations, and safety and health regulatory agencies worldwide. For further information please contact:

Prof. J. L. Smith, Conference Co-Chair, Department of Industrial Engineering, Mail Stop 3061, Texas Tech University, Lubbock, TX 79409, USA, Tel + 1(806) 742-3543, Fax +1 (806) 742-3411, E-mail: xujis@ttacs1.ttu.edu

International Organizing Committee

The International Organizing Committee consists of members of the Industrial Ergonomics Technical Group of IEA and representatives of the Polish ergonomics community.

Chairman: W. Karwowski, U.S.A.

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K. H. E. Kroemer, U.S.A.	K. Vanwonterghem, Belgium
M. Kumashiro, Japan	H. Wos, Sweden

An Invitation to New Poland

Experience Central Europe

You are invited to come to new Poland, a country reborn from the Cold War area. Take this unique opportunity to visit Warsaw, the Polish capitol, or travel to Krakow, the home of Jagiellonian University, one of the oldest European universities. While in the south, explore the beautiful Tatra mountains, and then travel to Czecho-Slovakia and Hungary. Or go north to relax at the coast of the Baltic sea and visit Gdansk, the city that changed the map of contemporary Europe. You may then continue your journey to famous St. Petersburg in Russia. But first, and most of all, experience the unmatched hospitality of the Polish people and their rich culture and traditions.

Come and visit new Poland.

About Warsaw

Warsaw (or Warszawa in Polish), is situated in the central part of the Mazovian Lowland. Divided by the Vistula River, Warsaw occupies about 500 square miles of land, and has a population of about two million inhabitants. The city first appeared on the map of Poland at the end of the 13th century, and became the state capital in 1611.

Warsaw is located 450 miles east from Berlin, 350 miles north from Prague and 500 miles from Vienna, and about 1000 miles west from Moscow. For a long time the city has been a link between Western and Eastern Europe. As the old story goes, once upon a time two businessmen were travelling, one from Moscow to Paris and the second one in the opposite direction. Both left the train in Warsaw, convinced that their journey was completed...

With a large concentration of industry and over twenty academic institutions, including two Universities and Polish Academy of Sciences, Warsaw is the biggest industrial, business, and science center in Poland. Warsaw is perhaps best known worldwide for such cultural events as the Chopin's International Piano Competition, the *Warsaw Autumn*: Festival of Contemporary Music, or Jazz Jamboree. The 47 museums, 15 art galleries, 21 theatres, the Grand Opera, Ballet Theater, and Warsaw Philharmonic influence the cultural life of Central Europe.

Explore the Old Warsaw

Although today's Warsaw is a modern and dynamic city, impressive remnants of the seven centuries of its history, including the Old Town and Royal Castle, can be seen almost everywhere. The Royal Castle, totally destroyed during World War II and recently rebuilt, is a monument of the nation's history, attracting large numbers of tourists from all parts of the world. Come and visit Zelazowa Wola, the birthplace of Fryderyk Chopin, or enjoy the beauty of interiors and gardens of the Wilanow Palace, the residence of Polish kings.

Conference Venue

The EMH '93 Conference will be held at the exquisite Warsaw **Marriott** Hotel, conveniently located in the center of Warsaw.

Official Language

English will be the working language of the Conference.

Accommodations

Conference participants will be offered a wide range of hotel accommodations located within a walking distance from the Warsaw **Marriott** Hotel. Student residences will also be available. Additional information will be provided in the *2nd Announcement* and *Preliminary Program*.

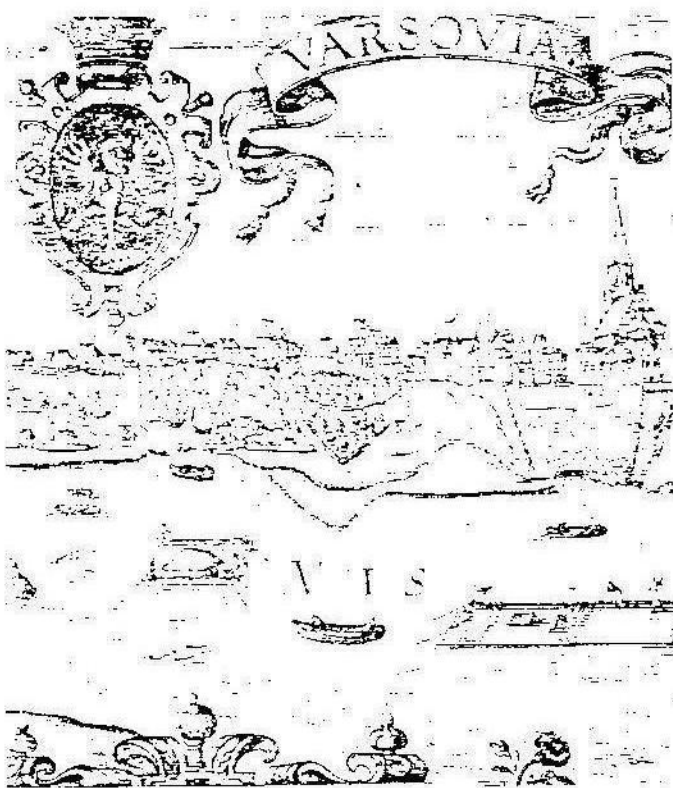
Pre- and post-Conference Tours

A number of pre- and post-Conference tours of Poland will be organized. More information about the planned tours will be provided in the *2nd Announcement* and *Preliminary Program*.

We look forward to seeing you in Poland in June 1993.

Welcome to Poland

Witajcie w Polsce



A view of Warsaw at the end of 16th century (anonymous drawing from G. Brown and F. Hogenberg, 1618)

The IEA World Conference on Ergonomics of Materials Handling '93

Please print or use block letters

Full Name (Mr/Mrs/Miss) _____

Please check all that apply:

☐ I am interested in attendance

I intend to submit an abstract for:

☐ Technical paper

☐ Poster presentation

I would like to organize:

☐ Round table discussion

☐ Special session on _____

Full Address _____

Telephone _____ Fax _____

E-mail _____

☐ Please send the Call for Papers/Registration Form to: _____

四元數、雙數、和螺旋理論 在機構設計之應用研究班

Applications of Quaternion, Dual Numbers, and
Screw Theory in Mechanism Design

日期：中華民國81年8月3日至8月15日止共二週

地點：國立成功大學機械工程研究所

主辦單位：教育部

國立成功大學機械工程研究所

協辦單位：中華民國機械與機器原理學會

參加對象：

甲類：各公私立大學院校聘任教師，政府及民間機構之專任人員，此類人員須經由具服務機構推薦參加研究班。

乙類：各公私立大學院校研究生或大學四年級學生，此類學員須經由具就讀系、所推荐，並在具就讀學校教務處登記後，向主辦學校申請選修研究班課程。

報名方式：以上兩類學員取得原單位推薦章並填妥報名表，寄國立成功大學機械工程研究所吳美青小姐辦理報名手續。

報名日期：即日起至八月五日止。

學分授予：凡學員於期未成績及格，且具有學士學位或符合報考大學是獨立研究所同等資格者，授予研究所三學分之證明書。主授以上資格者，授予推廣證明書。

費用：

預收講義費600元。

依申請學校宿舍者，酌收住宿費1,000元。

以現金或郵局匯票抬頭“國立成功大學機械工程研究所”支付。

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課程內容：

1. 四元數與雙數法：

- (1) 四元數：定義，運算，其幾何意義，與旋轉之關係。
- (2) 雙數法：代數運算，雙數角，雙數角之三角函數運算。
- (3) 雙向量：螺旋表示法，純生型，雙向量代數運算，連直螺旋與力單螺旋，動量螺旋與雙動力學方程式。
- (4) 雙四元數：定義與幾何意義，雙向量之內積，單位雙四元數，旋轉、滑動、螺距、螺距螺旋，速度及力積分析，螺距系統及暫態不變量，微分幾何與螺距曲面。
2. 螺旋理論與應用：
- (6) 實際機器之自由度與拘束問題探討。
- (7) 現行及將來會使用之接觸的接觸幾何問題。
- (8) 機構之螺旋理論與運動靜力學。
- (9) 工程實際上使用之約束與過約束運算。
- (10) 普通及特殊螺旋系統。
- (11) 螺旋系統之圖示。

3. 研究現況及未來發展趨勢：

- (12) 空間曲率理論。
- (13) 空間機構之電腦輔助設計軟體發展。
- (14) 機器手指之運動與力矩控制。
- (15) 閉鏈機器人系統之設計。
- (16) 多機械臂之合作。

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