25th Conference of Rectors and Presidents of European Universities of Technology

Research at Universities of Technology: National, European & International Aspects

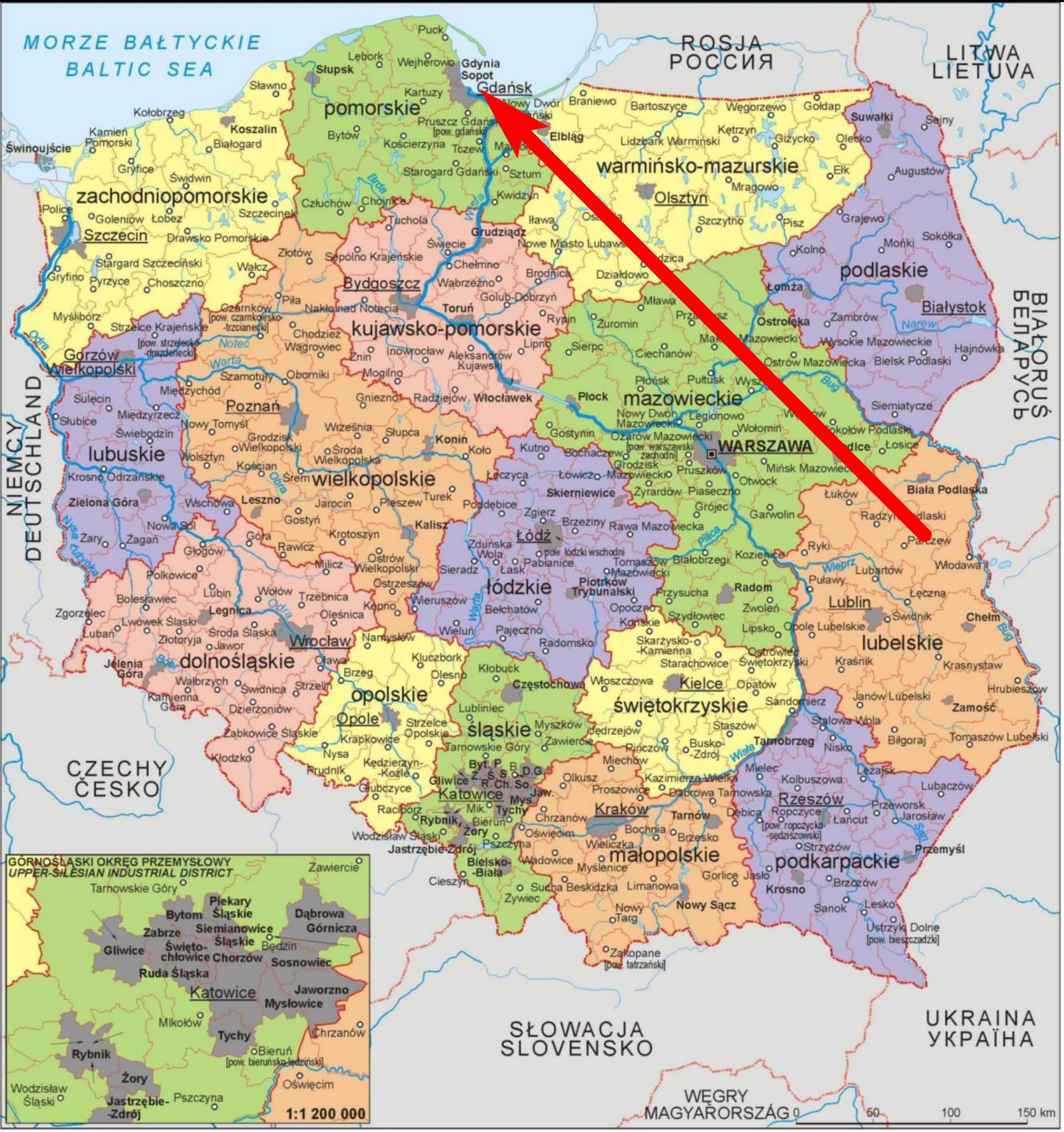
Vienna University of Technology
Austria
14-15 September, 2006

Gdańsk University of Technology
Rector: Prof. dr hab. inż. Janusz Rachoń


F.Y.R.O.M. - The Former Yugoslav Republic of Macedonia
Greenland (DENMARK)
Jan Mayen (NORWAY)
Greenland Sea
Denmark Strait
Barents Sea
Hammerfest
Tromsø
Murmansk
Norwegian Sea
Reykjavik
ICELAND
Arctic Circle
Kiruna
Luleå
Oulu
Arkhangel'sk
White Sea
NORWAY
Umeå
FINLAND
Trondheim
SWEDEN
Tórshavn
Faroe Islands (DENMARK)
Gulf of Bothnia
Tampere
Lake Ladoga
Lake Onega
Gävle
Turku
Helsinki
St. Petersburg
SHETLAND ISLANDS
Bergen
Oslo
Stockholm
ÅLAND ISLANDS
Tallinn
ESTONIA
RUSSIA
Rockall (U.K.)
ORKNEY ISLANDS
HEBRIDES
Stavanger
North Atlantic Ocean
Aberdeen
Göteborg
Gotland
Riga
LATVIA
Moscow
Glasgow
Edinburgh
North Sea
DENMARK
Copenhagen
Malmö
Vitsyebsk
Smolensk
LITHUANIA
Vilnius
Minsk
Mahilyow
Belfast
UNITED
Kaliningrad
RUSSIA
Bornholm
BELARUS
Dublin
Isle of Man (U.K.)
Irish Sea
Leeds
Manchester
Liverpool
IRELAND
KINGDOM
Gdańsk
Hrodna
Homyel'
Hamburg
Bremen
Berlin
Poznań
Warsaw
Brest
Amsterdam
Cardiff
Birmingham
NETH.
POLAND
Łódź
Kiev
Rotterdam
London
Celtic Sea
Essen
Leipzig
Cologne
Wrocław
Rivne
Brussels
BEL.
Lille
GERMANY
Bonn
Frankfurt am Main
Prague
UKRAINE
English Channel
Guernsey (U.K.)
Jersey (U.K.)
Luxembourg
LUX.
CZECH REPUBLIC
Brno
Kraków
L'viv
Chernivtsi
Mykolayiv
Paris
Stuttgart
SLOVAKIA
Bratislava
Chişinău
Strasbourg
Munich
Cluj-Napoca
Iaşi
MOLDOVA
Odesa
Nantes
Vienna
AUSTRIA
Budapest
HUNGARY
ROMANIA
LIECH.
Zürich
Bern
SWITZ.
Geneva
Vaduz
Bay of Biscay
FRANCE
Ljubljana
SLOVENIA
Zagreb
Bucharest
Constanța
Black Sea
Lyon
Turin
Milan
Venice
Bordeaux
Belgrade
Varna
Bilbao
Genoa
SAN MARINO
CROATIA
BOSNIA AND HERZEGOVINA
Sarajevo
YUGOSLAVIA
BULGARIA
Sofia
Toulouse
MONACO
Ligurian Sea
Florence
Andorra la Vella
Marseille
Adriatic Sea
ITALY
Skopje
Istanbul
Porto
ANDORRA
Zaragoza
Corsica
Rome
F.Y.R.O.M.
Bursa
Madrid
Barcelona
VATICAN CITY
Tirana
ALB.
Thessaloniki
PORTUGAL
Naples
TURKEY
Lisbon
SPAIN
Valencia
Balearic Sea
Sardinia
Tyrrhenian Sea
GREECE
Aegean Sea
İzmir
Sevilla
BALEARIC ISLANDS
Cagliari
Athens
Ionian Sea
Mediterranean Sea
Palermo
Gibraltar (U.K.)
Málaga
Sicily
Rhodes
Strait of Gibraltar
Ceuta (SPAIN)
Alboran Sea
Melilla (SPAIN)
Oran
Algiers
Tunis
Crete
Valletta
MALTA
Rabat
Casablanca
MOROCCO
ALGERIA
TUNISIA

RZECZPOSPOLITA POLSKA
podział administracyjny
stan w dniu 01.01.2006 r.

REPUBLIC OF POLAND
Administrative Division
as of January 1, 2006



Białystok — miasta wojewódzkie / *seats of voivodship authorities*

Chełm — miasta wydzielone (na prawach powiatu) / *seats of urban counties*

Grajewo — miasta powiatowe / *seats of counties*

granice państw / *international boundaries*

granice województw / *voivodship boundaries*

granice powiatów / *county boundaries*

przynależność obszaru powiatu do jego siedziby / *attachment of the county area to its seat*

Podano wyłącznie nazwy powiatów nie pochodzące od nazw ich siedzib
The only county names given on this map are those differing from the names of their corresponding seats

opracowanie kartograficzne/cart. design: Maciej Zych

The history of technical university in Gdansk revealed itself as a chain of transformations, which are somehow marked by the university's names which has changed many times within the last 100 years. They were as follows:

- **Königliche Technische Hochschule Danzig (1904-1918)**
- **Technische Hochschule zu Danzig (1918-1921)**
- **Technische Hochschule der Freien Stadt Danzig (1921-1939)**
- **Reichshochschule Danzig (1939-1945)**
- **Gdansk University of Technology (since 1945)**

The history of the technical university in Gdansk is marked by two basic dates, namely:

6th October 1904 and 24th May 1945.

To sum up, the academic year 2004/2005 was a jubilee academic year when we celebrated two very important events:

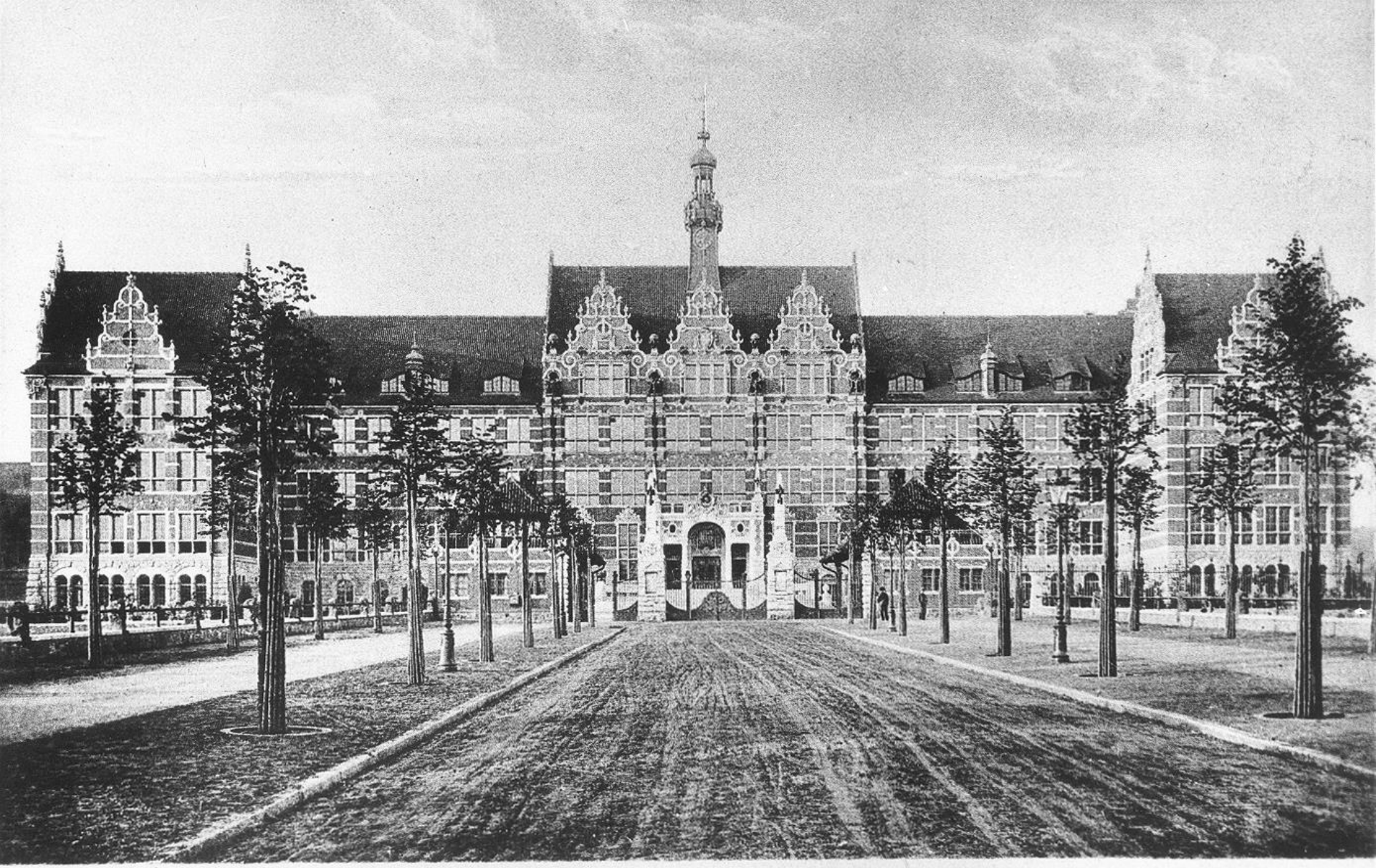
- 100 years of existence of the polytechnic in Gdańsk,

and

- 60 years of existence of the

Gdańsk University of Technology.

Gdansk University of Technology – year 1904



Main building of Gdansk University of Technology –year 1904.

Destroyed Main Building of Gdansk University of Technology. Year 1945.

Prof. W. Wawryk in front of the main gate of polytechnic – april 1945.

Main Building. The sight from the Traugutta street – year1945r. Sight for The Senate Hall windows

Main Building – present view

Dluga Street

Students of Gdansk University of Technology during reconstruction of Gdansk

Faculties of The University

- Architecture
- Civil and Environmental Engineering
- Chemical Faculty
- Electronics, Telecommunications and Informatics
- Electrical and Control Engineering
- Applied Physics and Mathematics
- Mechanical Engineering
- Ocean Engineering and Ship Technology
- Management and Economics

All of them are entitled to grant doctoral degrees, seven can also award habilitation.

Number of Faculties, Departments and Students at GUT

9 FACULTIES	DEPARTMENTS	STUDENTS
• Architecture	12	1002
• Civil and Environmental Engineering	14	2920
• Chemical Faculty	14	2356
• Electronics, Telecommunications and Informatics	16	3042
• Electrical and Control Engineering	8	1961
• Applied Physics and Mathematics	10	1030
• Mechanical Engineering	11	1723
• Ocean Engineering and Ship Technology	6	1225
• Management and Economics	10	2962
• Total	101	18221

Number of graduates at Faculties

FACULTIES	GRADUETS
Architecture	117
Civil and Environmental Engineering	353
Chemical Faculty	237
Electronics, Telecommunications and Informatics	314
Electrical and Control Engineering	129
Applied Physics and Mathematics	86
Mechanical Engineering	211
Ocean Engineering and Ship Technology	213
Management and Economics	599
Total	2168

Academic staff

Gdansk University of Technology employs 2553 people.

Among them:

- 111 titular professors,
- 140 doctors with ‘habilitation’
- 592 doctors

Only in 2005 academic personnel of our university were authors of 3576 publications, of which 345 appeared in the most prestigious periodicals of the Philadelphian list.

Positions financed by state funds

positions financed by state funds	2003	2004	2005	2006
full professors	107	106	108	111
lecturers and assistant professors	1105	1094	1083	1090
library staff	68	65	63	61
administrative staff	388	393	407	399
technical staff	425	424	412	413
workers and service	521	504	477	463
total positions (financed by state funds)	**2614**	**2586**	**2550**	**2537**

positions and staff

positions financed by state funds	1998	2002	2003
full professors	267	275	277
lecturers and assistant professors	846	821	816
library staff	74	71	69
administrative staff	379	371	366
technical staff	789	742	732
total positions (financed by state funds)	**2355**	**2280**	**2260**

positions financed by third parties	1998	2002	2003
faculty	935	1078	1193
staff	228	269	249
total positions (financed by third parts)	**1163**	**1347**	**1222**

additional temporal positions	1998	2002	2003
graduate assistants	2075	1914	1941
associate lecturers	304	236	231
trainees	167	138	138
total additional temporal positions	**2546**	**2288**	**2310**

Finances (in millions of Euro): Gdansk University of Technology and Universität Karlsruhe (TH)

	2004		2005	
	GUT	UK	GUT	UK
Personnel expenses	34.8	120,1	39,8	124,0
Supply expenses	7,7	25,7	8,2	26,3
Investment expenses	4,9	4,2	5,4	6,2
Other expenses	7,4	0,3	7,9	0,3
Expenses financed by third parties	3,2	70,7	6,7	82,8
Total expenses	58,0	220,9	68,0	239,6
Building expenses	3,3	30,5	4,0	18,8

Gdansk University of Technology

- Tradition of higher technical education in Gdansk is 100 years old
- Nowadays GUT has nine faculties and about 20,000 students
- In 2005 the Polish edition of Newsweek weekly ranked Gdańsk University of Technology as the best university of technology in Poland

International cooperation

Gdansk University of Technology maintains scientific cooperation with 137 universities and research centres from EU countries (under bilateral agreements)

Country	Number of universities	Country	Number of universities
Austria	2	Hungary	1
Belgium	5	Italy	18
Cyprus	1	Ireland	1
Czech Republic	1	Latvia	-
Denmark	6	Lithuania	3
Estonia	-	Luxembourgh	-
Finland	3	Malta	-
France	22	Portugal	4
Germany	35	Slovakia	1
Great Britain	7	Slovenia	2
Greece	4	Spain	11
Holland	4	Sweden	6

In the year 2005

- Gdansk University of Technology executed 105 bilateral agreements and about 140 agreements of the SOCRATES-ERASMUS Programme

- Scientists of our university were carrying out research on 58 topics. The number of topics explored in cooperation with: Germany – 9, Belgium – 9, France – 8, Italy – 4, Sweden – 7, Great Britain – 4, Canada – 4

- 11 topics of research were accepted as part of intergovernmental programmes or executive protocols

Gdansk University of Technology

International Cooperation and Research

- **Structural Funds** **32 projects**
- **EU Framework Programmes** **41 projects**
- **others:** **26 projects**

(PHARE, EIPAM, Interreg)

5th Framework Programme in 2005

Number of projects – 10. Among them:

- Centre for Urban Construction and Rehabilitation:
  technology transfer, research and education CURE
  Contact person: Prof.Cz. Szymczak, Faculty of Civil and Environmental Engineering
  Project Funding: 200,000 Euro

- Centre of Excellence in Environmental Analysis and Monitoring CEEAM
  Contact person: Prof.. J. Namieśnik, Chemical Faculty
  Project funding: 250,000 Euro

- Sustainable Road Surfaces for Traffic Noise Control SILVIA
  Contact person: Prof.. Ejsmont, Mechanical Faculty
  Project funding: 120,000 Euro

6th Framework Programme at GUT

Number of projects – 16. Among them:

- Personalized Information Platform

  for Life and Health Services PIPS

  Contact person: Prof. J. Górski, Faculty of Electronics,

  Telecommunications and Informatics

  Project funding: 3,500,000 Euro

- Preservations towards storage and access. Standarised

  Practices for Audiovisual Contents in Europe PRESTOSPACE

  Contact person: Prof. J. Czyżewski, Faculty of Electronics,

  Telecommunications and Informatics

  Project funding: 100,000 Euro

6th Framework Programme at GUT

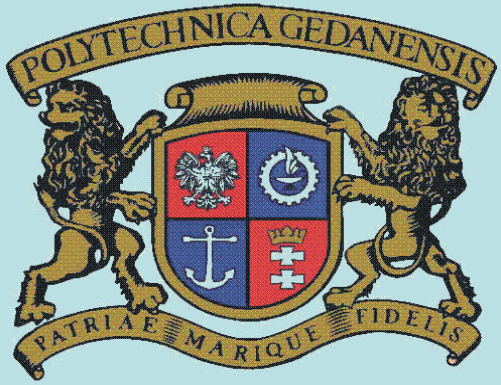
- Safe abandoning of ships. Improvement of current Life Saving Appliances Systems SAFECRAFTS

  Contact person: Prof. Cz. Dymarski,

  Faculty of Ocean Engineering and Ship Technology

  Project funding: 100,000 Euro

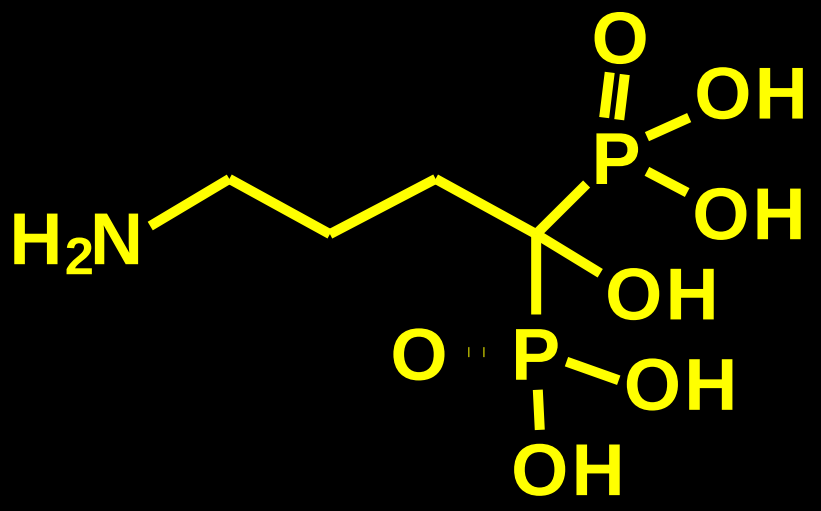
Gdansk University of Technology is a coordinator of the „Regional Innovation Strategy for Pomeranian Region – complement and action plan RISP”.



Gdansk University of Technology
Best Scientific Achievements

Ostemax 70 Comfort

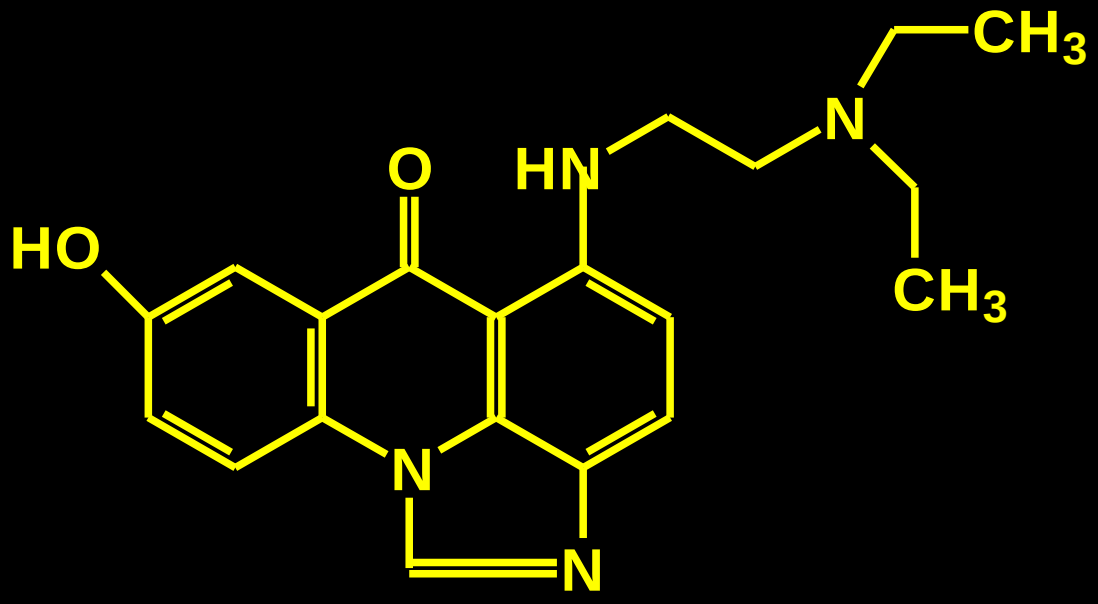
In 2004 the team of Prof. J.Rachoń developed a new technology of generating alendronate sodium, which is the base for production of a drug called Ostemax 70 Comfort.
Used in osteoporosis treatment, the medication can be administered to patients on a less frequent basis than other drugs used until now.
Moreover, the new method of synthesis is more environment friendly.



Alendronic Acid
Alendros; Fosamax

Anti-tumour drug

On 15 January 2004 Xanthus Life Sciences Company in Cambridge, Mass, USA, specializing in organization and conduct of clinical research on potential anti-tumour drugs announced the launch of the Phase 1, and from 2006 Phase 2 of the clinical program on imidazoacridone C-1311 (Symadex), the substance generated by the team of Prof. J. Konopa. The trials included patients with advanced cancerous tumours.



C 1311
Symadex

New technologies for medicine

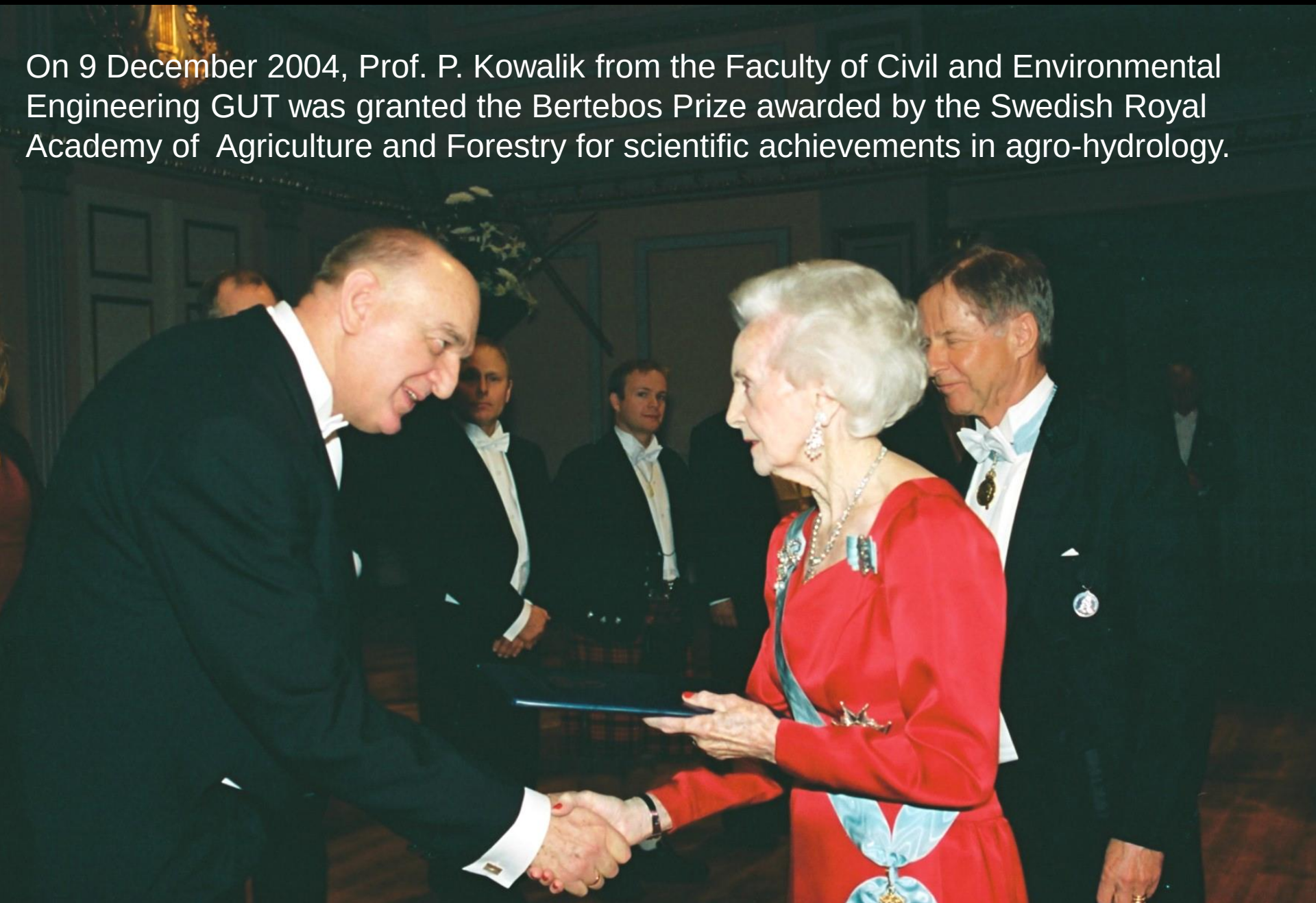
In the past few years

the Faculty of Electronics, Telecommunications and Informatics has enjoyed a great deal of successes related to its contribution to healthcare service. They consist in the development of:

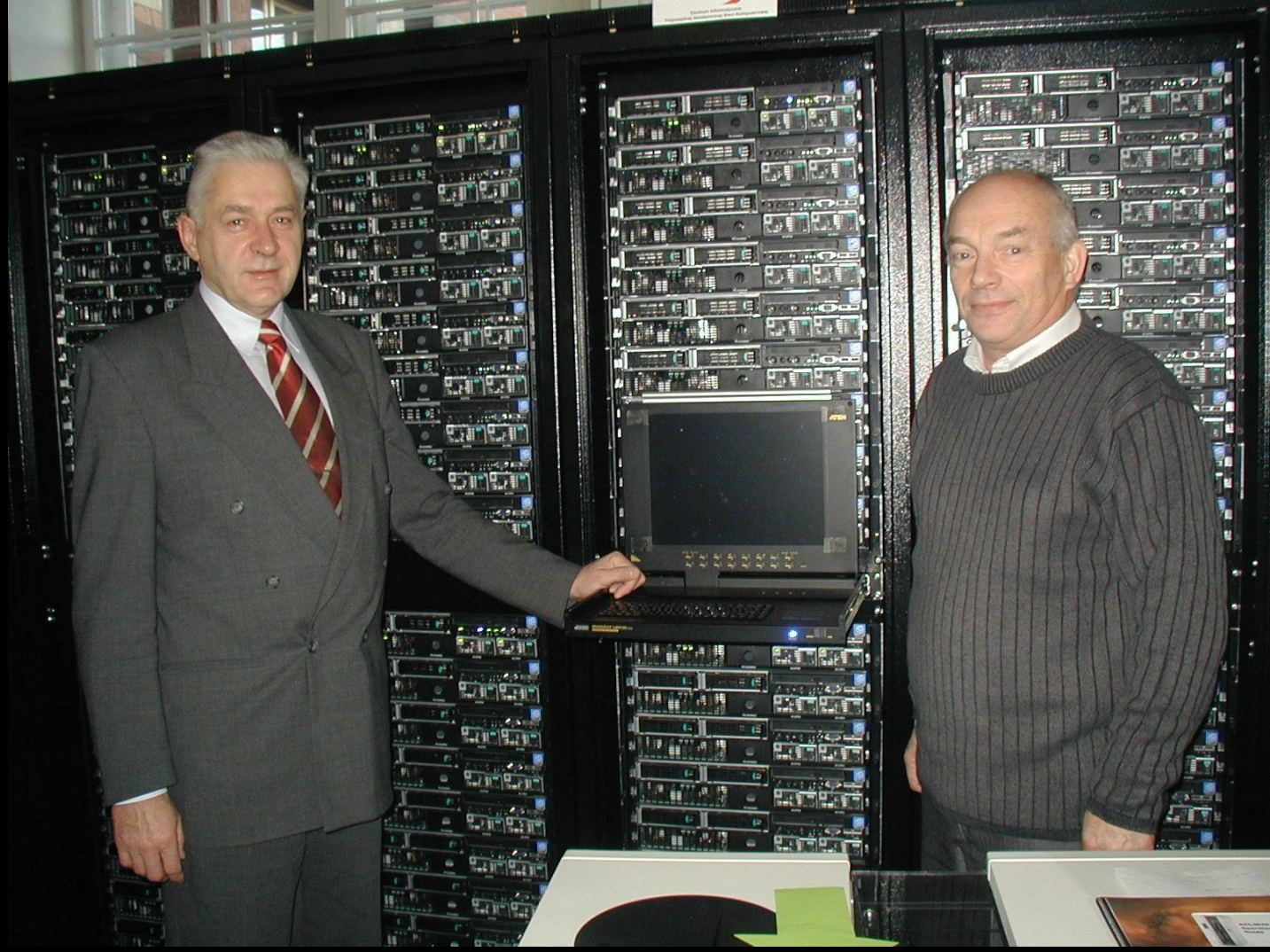
- Systems for correction of hearing (Prof.A.Czyżewski) or speech impairments and vision defects
- Computer systems for endoscopic and radiological examination filing and diagnostics (Prof.A. Nowakowski)
- Systems supporting the early detection of various types of tumour diseases (Prof.. A. Nowakowski)

„Agricultural Nobel”

On 9 December 2004, Prof. P. Kowalik from the Faculty of Civil and Environmental Engineering GUT was granted the Bertebos Prize awarded by the Swedish Royal Academy of Agriculture and Forestry for scientific achievements in agro-hydrology.

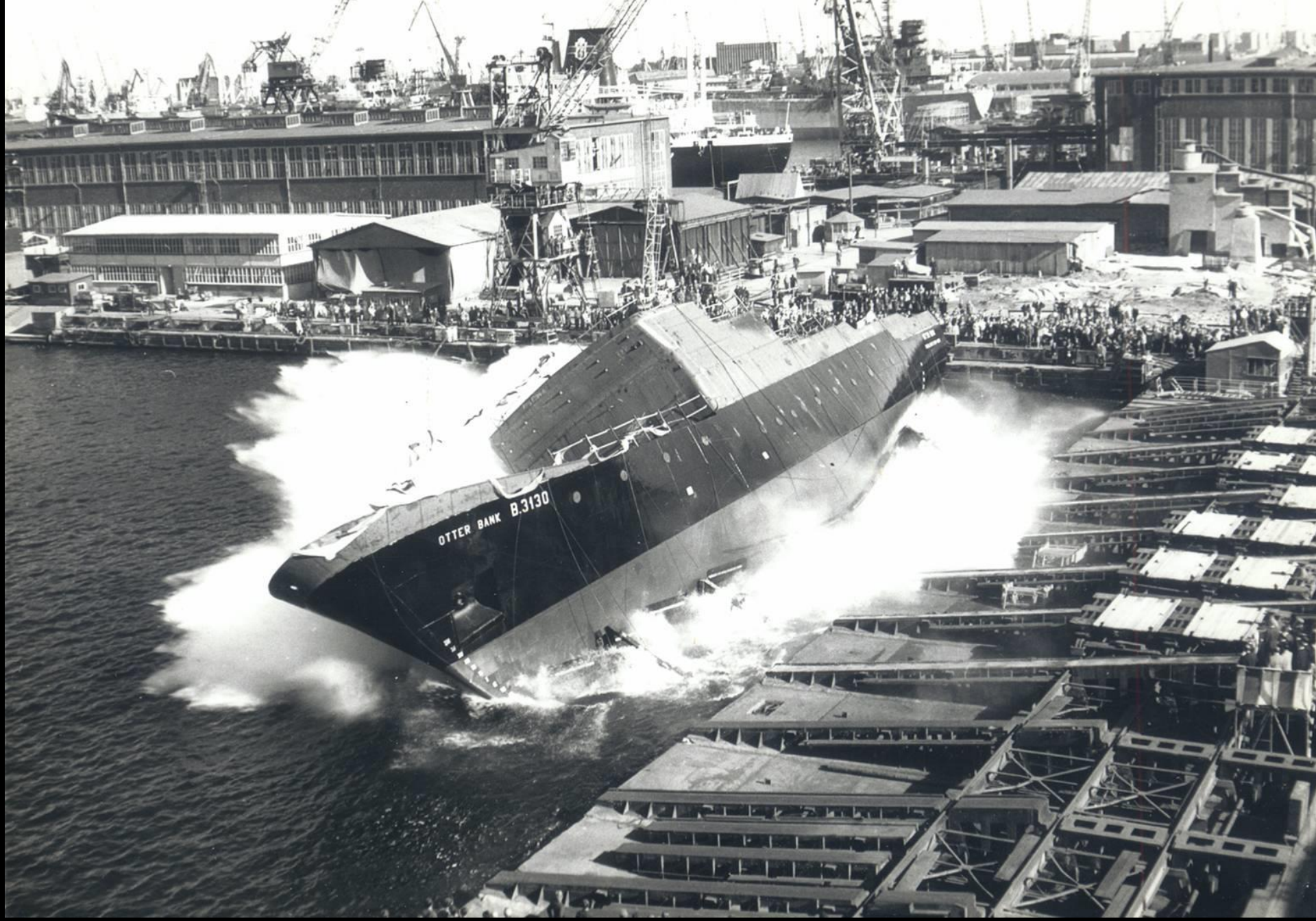


On 20 October 2003 in the presence of Mr. Stacy Smith, the Vice-President of INTEL Corporation, a computer cluster of the new generation was started at the Gdansk University of Technology.



The cluster is the fastest computing machine in Poland and is now in the group of 100 fastest computers in the world, being the sole Polish computer placed at the so called TOP 500 list.

s/s „SOLDEK” – the 1-st sea-going Polish built ship at the outfitting pier of Gdansk Shipyard – in the middle prof.. J. W. Doerffer, Naval Architect – the builder of the ship



Side launching of the hull of fish trawler at Gdynia Shipyard

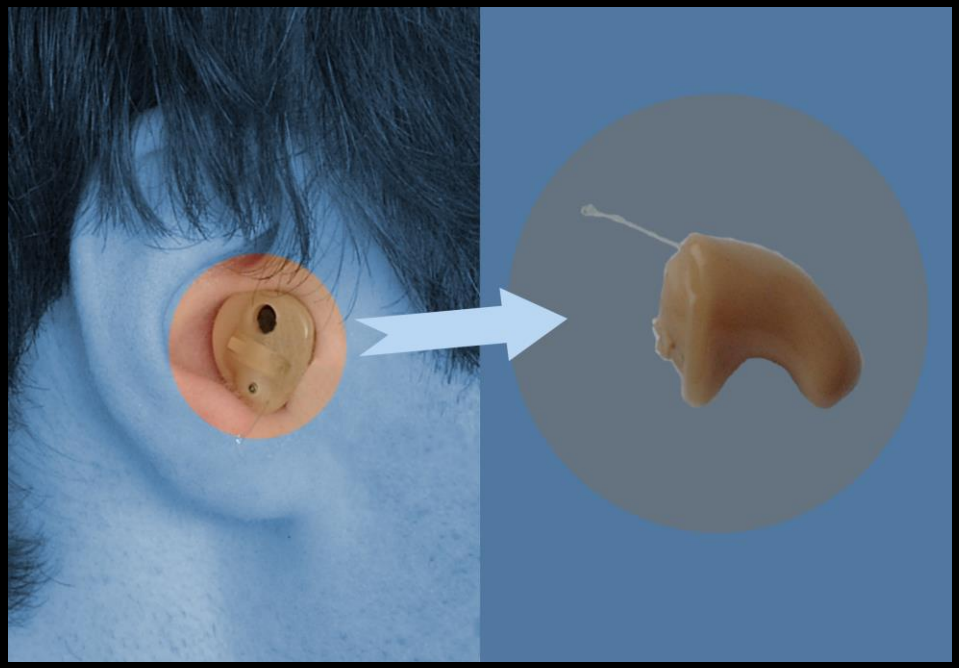
„ZRYW” - Hydrofoil – sea going vehicle (L=27.6m; speed 35 knots=65 km/h) designed by the Faculty of Ocean Engineering and Ship Technology, GUT

Mine-sweeper – hull made of GRP – Polish Navy

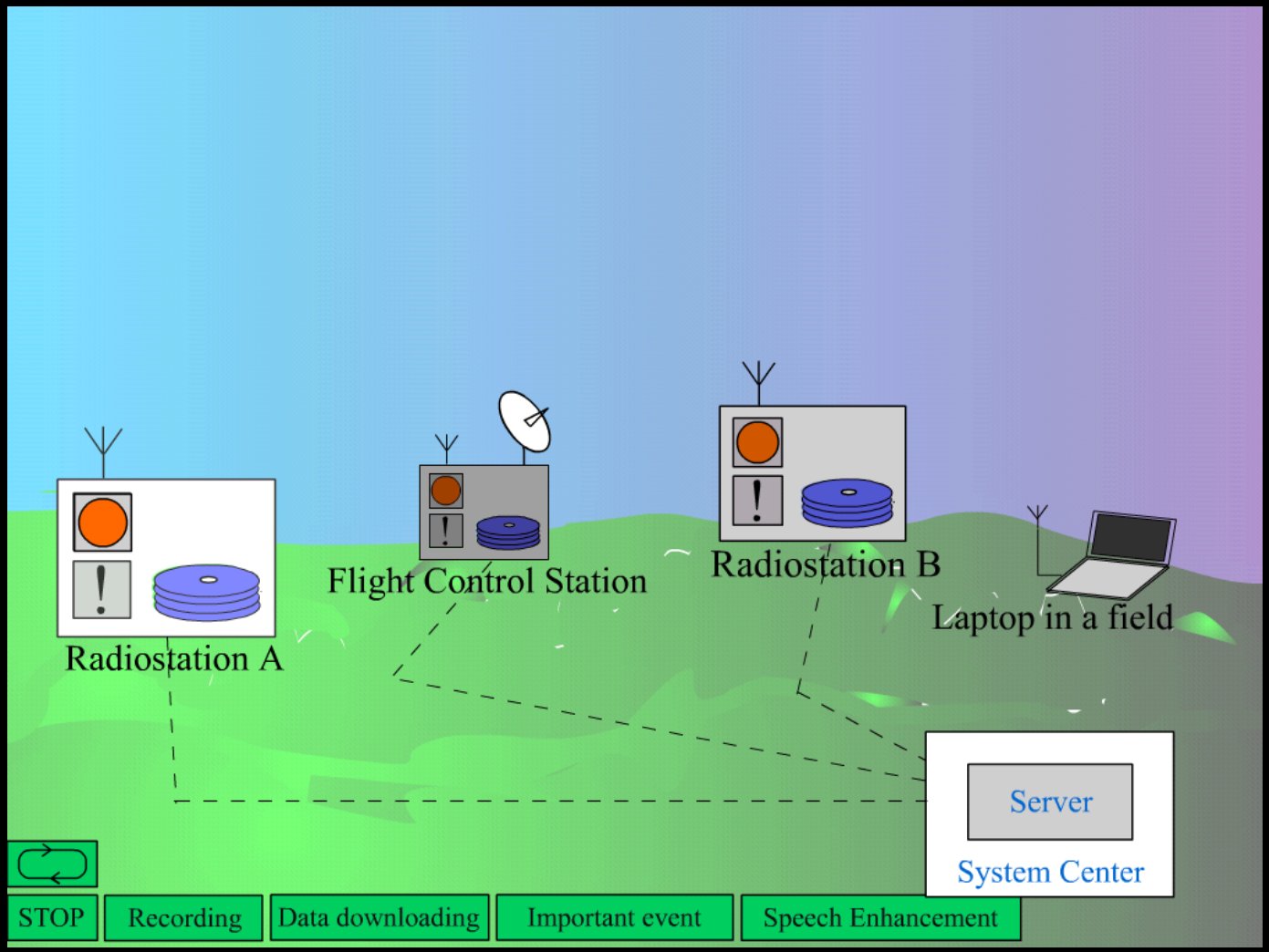
Systems for screening testing of hearing, speech and vision over Internet

0.5 million children tested in Poland. Testing results from 60 countries recorded in the database

Subminiature Digital Speech Corrector for Stuttering People

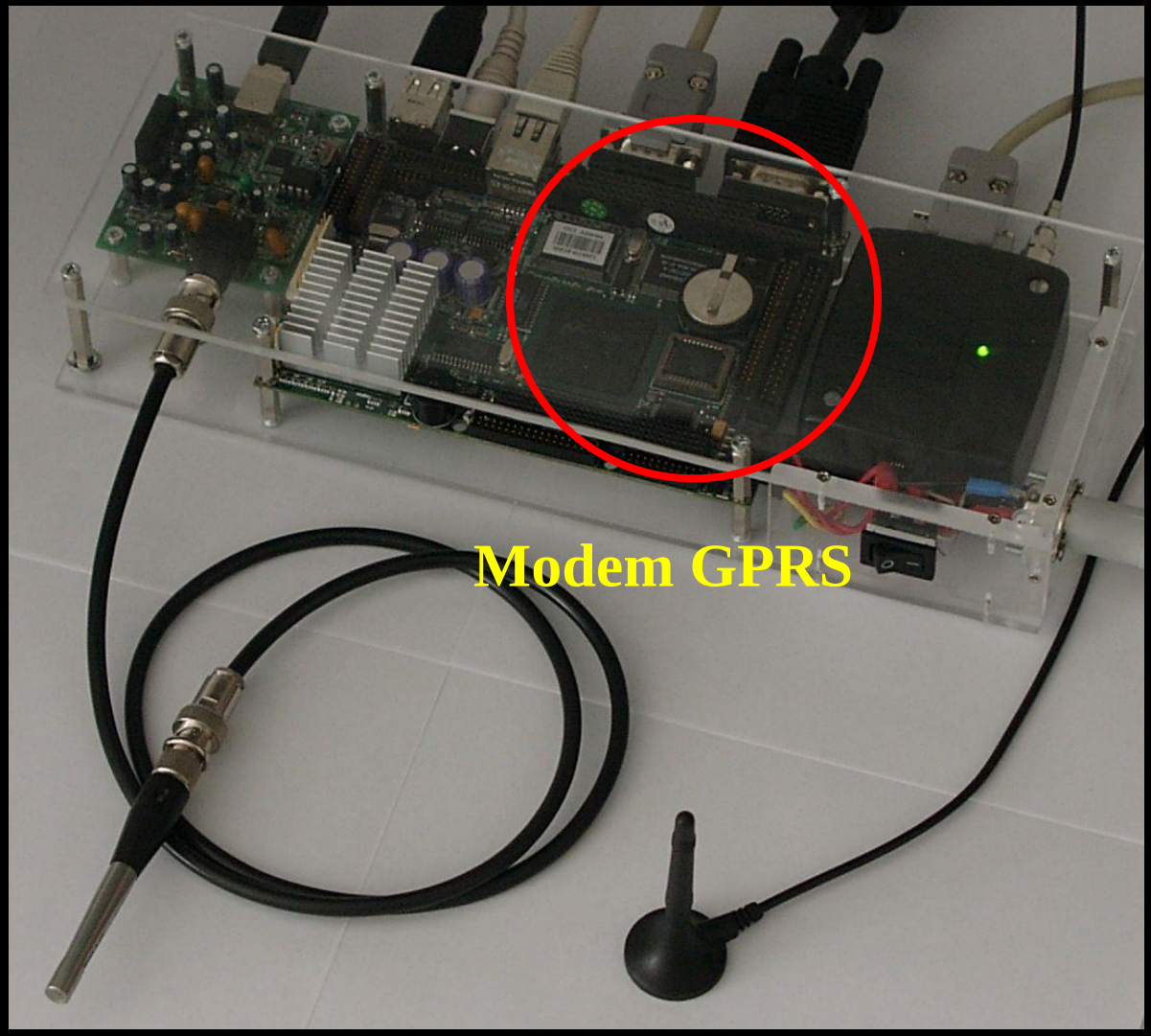


A System for Multitask Noisy Speech Enhancement

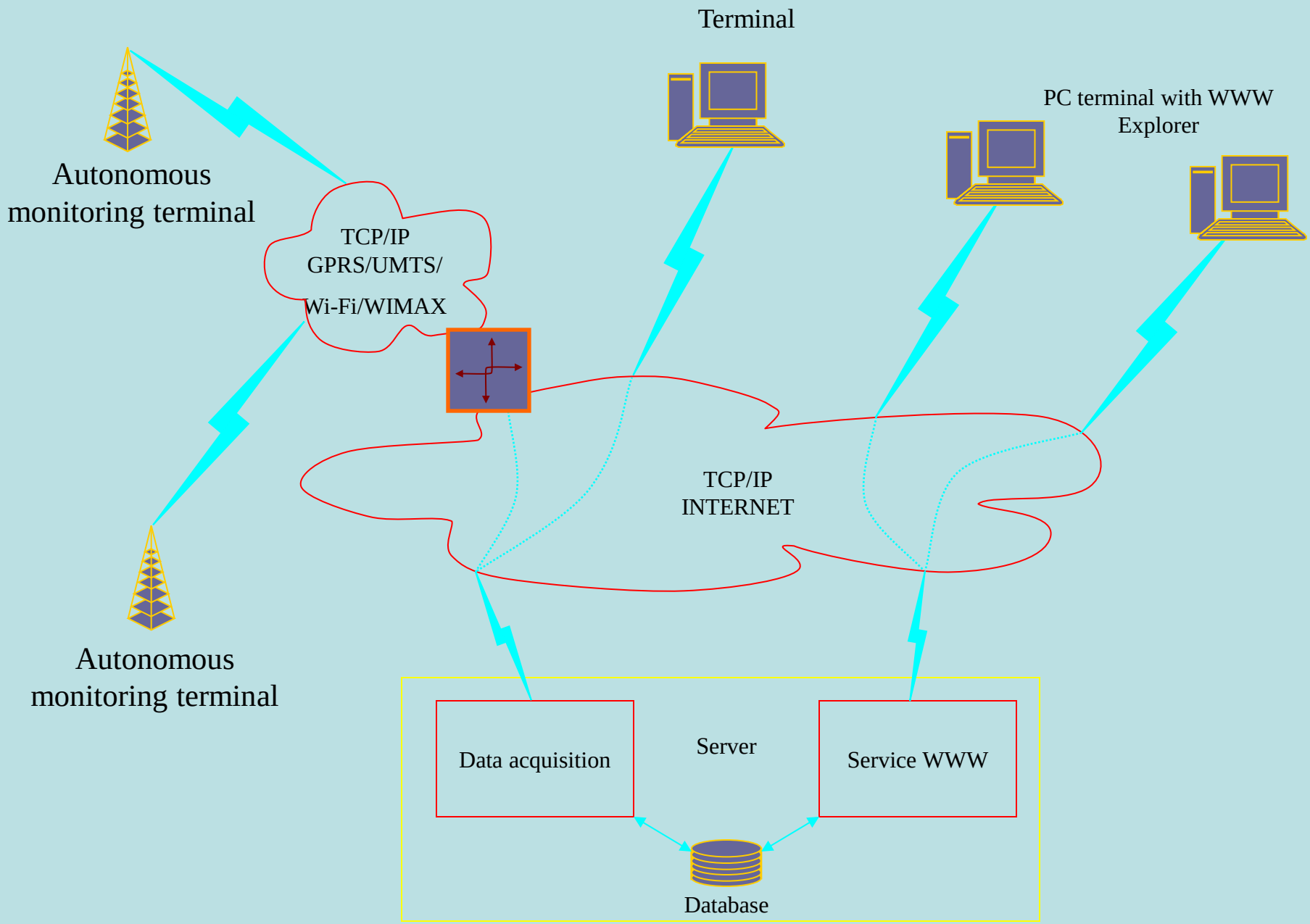


developed for the Air Force Academy (Deblin, PL)

Environmental noise monitoring station and system



Wireless noise telemonitoring system



Internet service for remote restoring of old audio recordings

Main Page
Sound Restoration
Recording Database
Network Services
Tutorials
About the Site

SOUND RESTORATION SITE

This WWW service is devoted to the restoration of recorded sound. We offer restoration not only archival musical recordings, but also speech, reportage, special recordings (improving document recordings, sound acquired in difficult acoustical or transmission conditions etc.). We plan to introduce full fledged "*sound restoration on demand*" service which will be operated entirely by the remote user basing on some automatically working declicking and denoising algorithms.

Nevertheless, before this site is working fully automatically and our clients would be able to restore any sound material according to their needs, we offer just now the possibility of enhancing the material that is of a considerable historical value and generally is worth restoration and publishing.

Because we conduct research in this domain, one can find here information concerning some new methods of sound restoration developed at our Multimedia Systems Department.

Moreover, we included some tutorials related to the domains comprising our research field such as: psychoacoustics, modeling of hearing functions, artificial intelligence and digital signal processing applied to noise reduction.

Content

- **Sound Restoration** Conceptual and technical description of the developed sound restoration methods
- **Recording Database** Collection of exemplary recordings before and after the restoration
- **Network Services** Uploading sound files to be restored and downloading processed files
- **Tutorials** Information concerning psychoacoustics, artificial intelligence and methods for sound restoration
- **About the Site** Additional information about this service

CONTACT WITH SERVICE PROVIDERS

Consequently, we welcome all private persons or institutions wanting to upload the valuable sound material to our server, have it restored basing on the intelligent audio enhancement algorithms and download it back to their computers. We reserve the right to publish a fragment of this material in our database containing sound examples. The collection of sound examples presents the original form of the recording, the restored form and in some cases the spatialised (stereo sounding) version of the audio example. Typically, the difference signal (the removed noise) is also shown in our sound example database.

At this stage of development of our sound restoration service we cannot claim that we will restore any sound material according to the need of our clients, however if the client will be able to convince us that this material belongs to the cultural heritage or if the uploaded sample is of technical value to us, we will do this for sure and without any cost.

evolved to an FP6 Integrated Project „PRESTOSPACE”


MIĘDZYNARODOWE TARGI GDAŃSKIE SA
2001
INNOWACJE


BRUSSELS
EUREKA


ASSOCIATION DES PETITS FABRICANTS ET INVENTEURS FRANÇAIS
CONCOURS LÉPINE


FOIRE INTERNATIONALE DE POZNAN


THE WORLD EXHIBITION
OF INVENTION, RESEARCH
AND INDUSTRIAL INNOVATION


DYPLOM


LA MINISTRE WALLONNE DE L'EMPLOI
ET DE LA FORMATION.


NAGRODA
PRZEWODNICZĄCEGO
KOMITETU BADAŃ
NAUKOWYCH

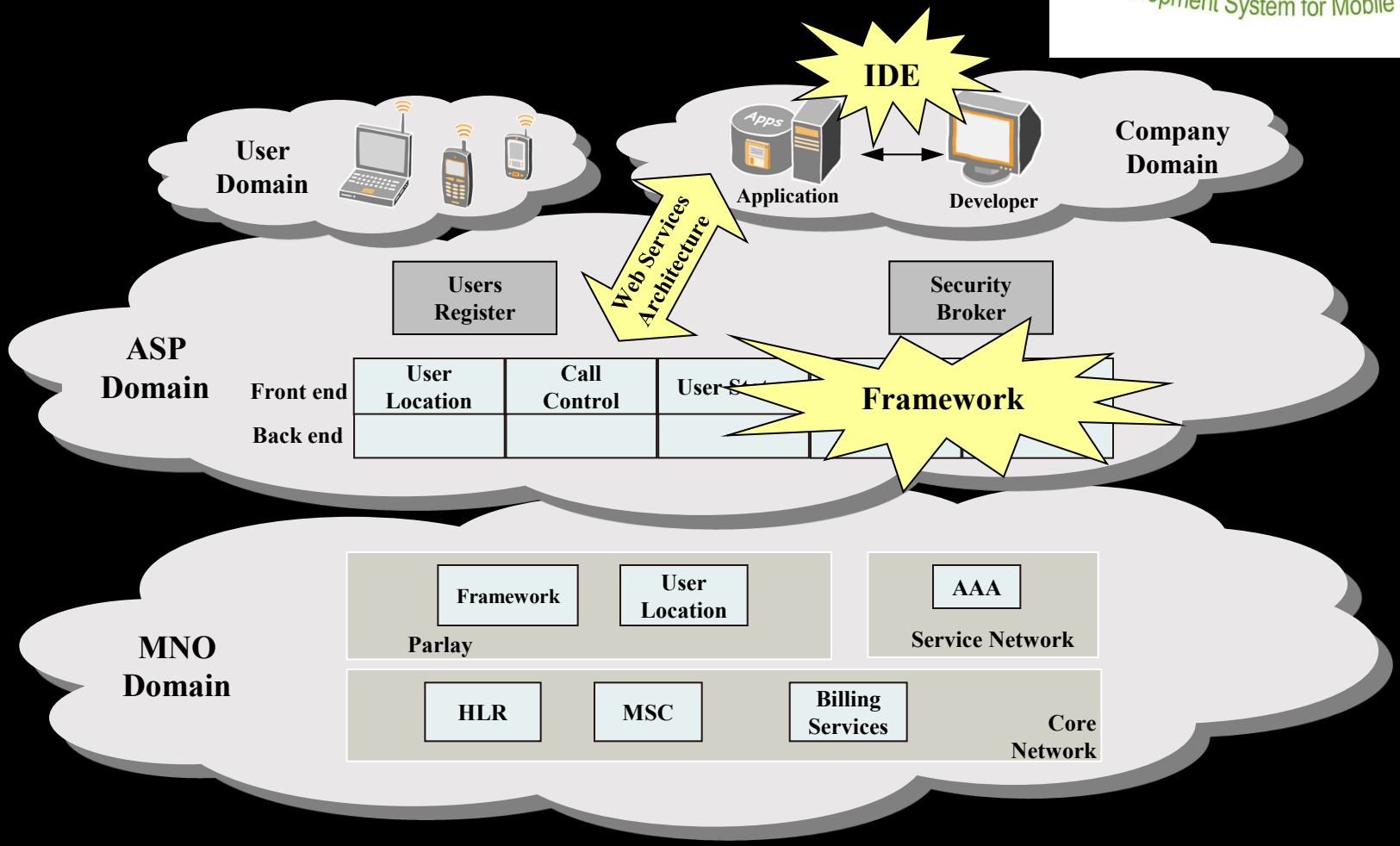

eEurope Awards
for eHealth - 2004
FINALIST
www.telewelfare.com
International Centre of Hearing and Speech
and
Gdansk University of Technology
www.eu2004.ie
Erkki Liikanen
Member of the European Union
Information Society
European Commission

Cathedral in Lichen (Poland)

Cable-Stayed Bridge in Gdansk. „Third Millennium John Paul II Bridge” – night view

Programmable services in mobile networks (international project)

desyme
Development System for Mobile Services



Centre for Urban Construction and Rehabilitation CURE,
located at the Faculty of Civil and Environmental Engineering,
Gdańsk University of Technology,
is a Polish Centre of Excellence financially supported
by the European Commission

MISSION

The mission of the Centre is to promote education
and research in the field of urban construction
with a special emphasis laid on technology
transfer for rehabilitation of urban infrastructure

THE CENTRE OPERATES WITHIN THE FOLLOWING FIELDS

- Sustainable development of urban area
- Advanced mechanics of urban structures
- Effective use of building materials
- Optimisation of constructing processes
- Innovative building systems
- Effective design and manufacturing
- Safe road transport
- Optimal urban land use planning
- Rehabilitation of existing urban building stock

EXAMPLES OF CURE ACTIVITIES

Wisłoujście Fortress – behaviour prognosis of high value historical structure

Cable-stayed bridge in Gdańsk – project and experimental tests

WiComm - Center of Excellence for Wireless Communication Engineering

Gdańsk University of Technology

Department of Electronics, Telecommunications and Informatics
Gdańsk University of Technology
Narutowicza 11/12, 80-952 Gdańsk, Poland
www.wicomm.org wicomm@wicomm.org

WiComm

WiComm goals:

- World class research
- Innovative solutions
  - Technology transfer from academia to industry
  - Commercialization of inventions through cooperation with existing companies, creating spinoffs, startups

WiComm: Head:
prof. **M. Mrozowski** +
6 scientists,

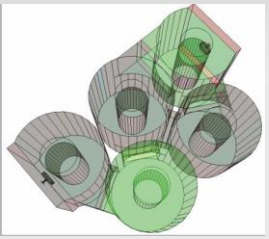
2 technical staff,

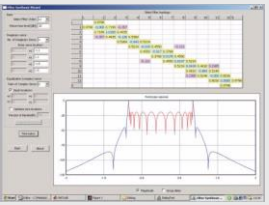
10 PhD students,

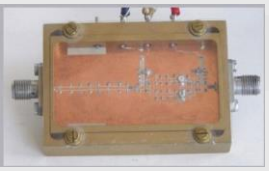
+ experts

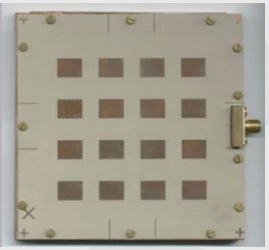
www.wicomm.org
www.wicomm.pl

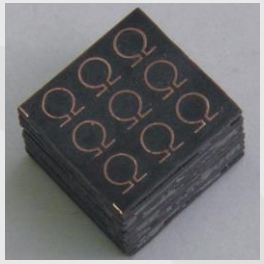
Research focus

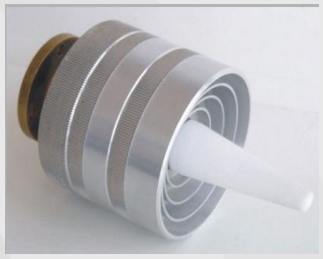


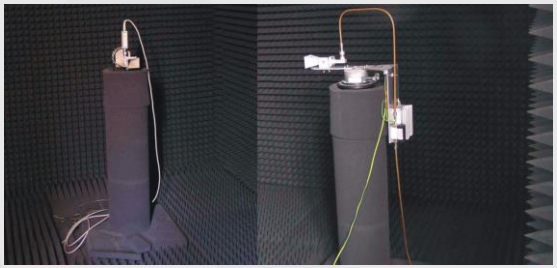












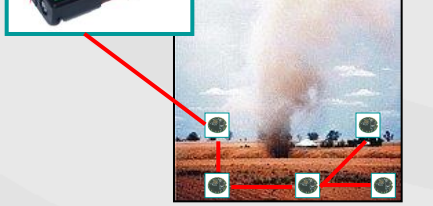
- → Methods of computational electromagnetics aimed at custom microwave/RF CAD tools
- → Analysis, design, prototyping and measurement of microwave/RF circuits, antenna and subsystems
- → Electromagnetic compatibility and signal integrity
- →Propagation of the radio waves in buildings and urban environment
- →Wireless sensor networks

Wireless technologies

- New technologies

RFID

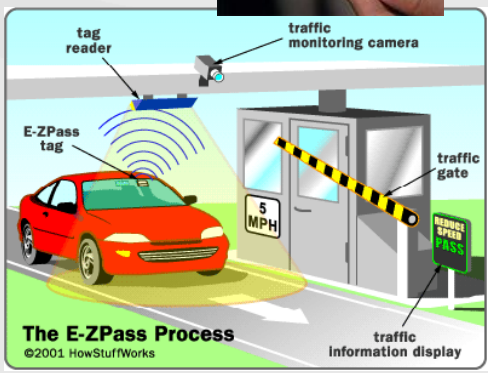
Smart shelves



Smart sensor networks

WiFi

VoIP (WiFi, WiMAX)

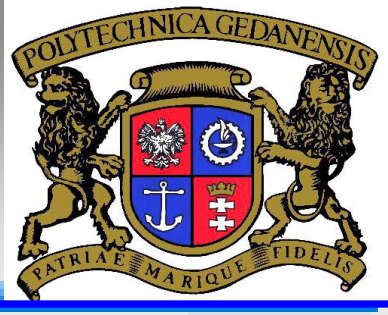


Remote identification

WiComm – current projects

- Research projects
  - 5 projects funded by the domestic (Ministry) and foreign (US Air Force, US Army) sources
- Technology transfer projects
  - 2 projects funded by EU

Centre of Excellence INFOMOR „Applications of Information Technologies in Research and Monitoring of Marine Environment”



General description of activity:

The Centre integrates the leading scientific and research organisations from Gdansk region for common research and technology transfer in the area of the multi aspect investigation and monitoring of the marine environment using underwater acoustic techniques and information technology.

Centre of Excellence INFOMOR „Applications of Information Technologies in Research and Monitoring of Marine Environment”

<u>Development and concentration on actual topics:</u>

1. Detection and monitoring of pollution aggregations in marine environment
2. Creating the multi-component, 3D digital charts of the Southern Baltic Sea
3. Web-based GIS for marine living resources investigation and management
4. Web-based system for flood and other emergency awareness

Development new topics and areas:

1. Implementation of the interactive 3D Web-based GIS for marine environment pollution monitoring, mapping and prediction

Implementation of the new method of underwater objects visualization from sidescan and multibeam sonar data, implemented in VRML language

The Centre for Advanced Technologies „Pomerania”

1. Biotechnology and chemistry of drugs and food
2. ICT technologies
3. Advanced materials & nanotechnologies
4. Ecotechnologies + Safety in Industry, Homeland Security and Internal Security

Composed of: 5 Universities + 10 Research Institutes + 21 Firms + 10 supporting institutions + number of institutions constantly growing up – GUT acts as a co-ordinating institution

CENTRUM ZAAWANSOWANYCH TECHNOLOGII "POMORZE"

The Centre for Advanced Technologies „Pomerania”

The Center for Advanced Technologies was founded to provide a bridge between government, industry and academia, and to encourage cooperative efforts on technology development. So that its main role is to promote project employing both academia & industry.

It operates under the umbrella program Sector Operational Program "Increasing of Competitiveness of Enterprises". This program uses financial support on the European level.

Dyplom

5. Międzynarodowa Wystawa Wynalazków
INNOWACJE 2003

NAGRODA MINISTRA NAUKI I INFORMATYZACJI
prof. Michała Kleibera

dla

POLITECHNIKI GDAŃSKIEJ

za
szczególne osiągnięcia w dziedzinie wynalazczości

Wiesław Kiciński
Przewodniczący Jury

Władysław Kołeczko
Prezes Stowarzyszenia
Polskich Wynalazców i Racjonalizatorów

Kazimierz Jarecki
Prezes Zarządu
Międzynarodowych Targów Gdańskich SA

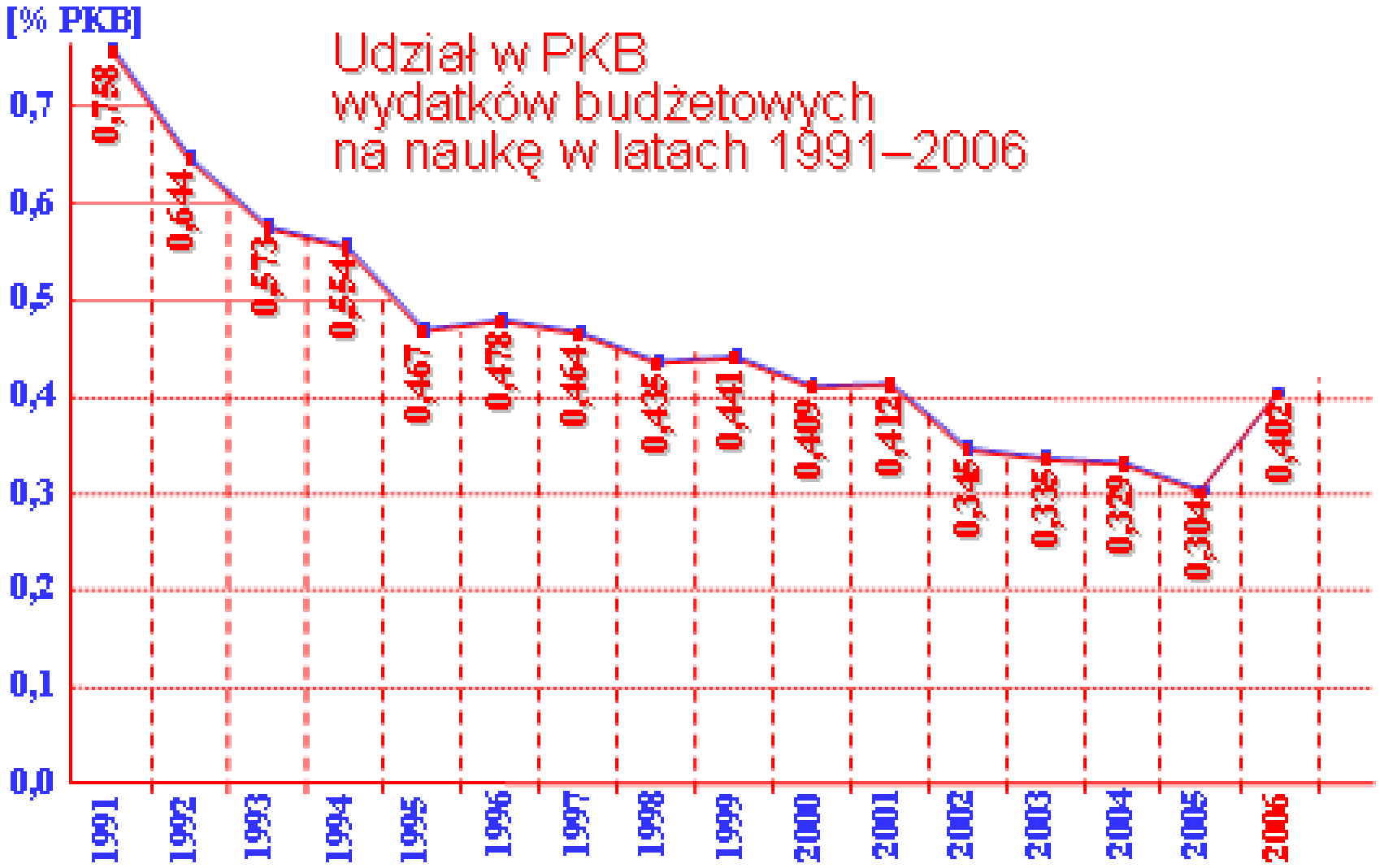
Gdańsk, 10.10.2003

GUT the laureate of the Economic Prize of the President of the Republic of Poland

Polish problems with participation in EU projects and using EU funds

1. lack of experience
2. ignorance of the European regulations and importance of lobbing
3. insufficient promotion of Polish science
4. "isolated participation" - Polish subjects don't usually cooperate at national level in applying for the EU funds
5. low person/month rate

Thank you for your attention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