

Jürgen Mottok, Olaf Ziemann (Editor)

Applied Research Conference 2012

ARC 2012

25./26. June 2012

Nuremberg

Organizer:

Georg-Simon-Ohm Hochschule, Nürnberg

Hochschule Regensburg, Regensburg

Hochschule Deggendorf, Deggendorf

Hochschule, Ansbach

Hochschule, Ingolstadt

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Preamble

The ARC 2012 is the second conference as part of the master program “*Master of Applied Research*”. The conference proceeds on June 25th and 26th 2012 at the Georg-Simon-Ohm *University of Applied Sciences* Nuremberg.

During the ARC 2012 conference, students of the mentioned master program present their research results within conference sessions and papers.

All research papers are selected for an oral presentation of the results achieved during research work within their projects. While presenting their findings, the conference should enable the students to reconsider their work with the help of feedback from the participants, they should gain motivation and it should assist their personal and academic progress.

The master program *Master of Applied Research* integrates enrolled students into a research subject during three semesters study time. They participate as members in a research team and are guided by the professor responsible for the research project. Student's research work is divided into project sections and the master thesis. Accompanying lectures are selected in the context of the research subject from established master programs and are supplemented.

The ARC 2012 conference day will be completed by a conference dinner where we have the opportunity within a relaxed ambience to get together, exchange ideas, discuss and reflect on students' work. The publisher as initiator of the study program will have the opportunity to divert by an after dinner speech with an outlook on *Succeeding through Innovation*.

In conclusion we would like to express our gratitude to all partners and supporters of the conference. We want to express special thanks to the involved colleagues who have undertaken to support the development of the study program and the additional workload necessary for accreditation in addition to their daily work in education and research. The fruit of their academic work will not only be the success in research but on top of that it will be the guidance of young people into their careers and the supervision of the academic and innovative growth of these young engineers.

Special thanks go to Sandra Dirnberger, the Regensburg faculty EI consultant, for her outstanding performance in managing administrative matters. She was permanently involved in organization and problem-solving and, furthermore, an always addressable and perfectly helpful contact person.

In closing, let us give thanks, on the help to all involved Universities of Applied Sciences.

Regensburg, May 2012

Sgd. Prof. Dr. Jürgen Mottok, Prof. Dr. Olaf Ziemann, Prof. Dr. Anton Horn

Vorwort zum Konferenzband

Anton Horn, Hochschule Regensburg
Jürgen Mottok, Hochschule Regensburg
Olaf Ziemann, Hochschule Nürnberg

Zum Wintersemester 2009 wurde an den Hochschulen Regensburg und Nürnberg ein neuer, gemeinsamer Studiengang eingeführt, dem ein Semester später auch die Hochschule Deggendorf beiträt. Seit September 2011 ist der Studiengang auch akkreditiert. Zum Sommersemester 2012 nimmt die Hochschule Ingolstadt am Verbund teil und mit Augsburg wird zum Herbst der fünfte Partner aufgenommen werden. In Ansbach wird der Forschungsmaster selbstständig durchgeführt, allerdings fakultätsübergreifend, während in den anderen Hochschulen jeweils die elektrotechnischen Fakultäten federführend sind. Wir haben aber eine enge Kooperation vereinbart, so daß Studenten aus Ansbach auch an unseren gemeinsamen Veranstaltungen teilnehmen. Zusammen mit dem bereits seit 2005 erfolgreich durchgeführten Masterstudiengang der Hochschulen Coburg, Aschaffenburg und Würzburg/Schweinfurt gibt es inzwischen ein breites Spektrum an projekt-orientierten Studiengängen in Bayern (Bild 1).

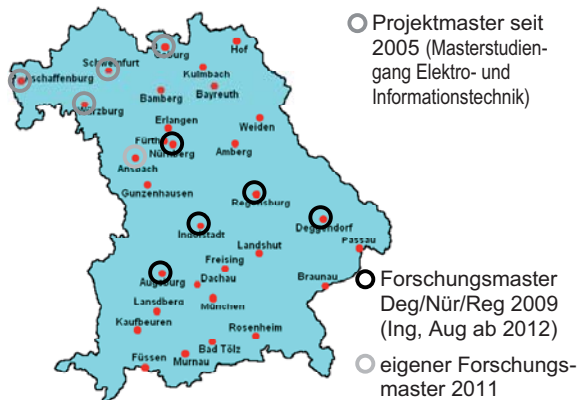


Bild 1: Projektorientierte Masterstudiengänge an bayerischen HS

Wie die Zahl der Immatrikulationen im Forschungsmaster seit Wintersemester 2009 zeigt, erfreut sich der Studiengang zunehmender Beliebtheit.

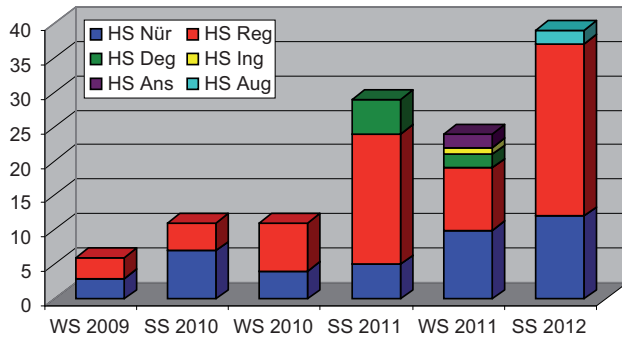


Bild 2: Immatrikulationen seit WS 2009

Eine der wesentlichen Bestandteile des “Masters of Applied Research in Engineering Sciences” ist die Teilnahme an gemeinsamen Lehrveranstaltungen. In den Fächern “Forschungsmethoden und -Strategien 1 & 2” besuchen die Studierenden gemeinsame Kurse an den beteiligten Hochschulen und bekommen dort, speziell auf die Erfordernisse des Studiengangs, spezifische Kenntnisse und Fertigkeiten für das selbstständige Arbeiten in Forschungsprojekten vermittelt.

Einmal im Semester werden Seminare oder Applied Research Konferenzen (ARC) organisiert. Hier haben die Studierenden die Möglichkeit in Vorträgen (und bei Bedarf auf Postern) die Ergebnisse des letzten Semesters vorzustellen und mit Betreuern und Kommilitonen zu diskutieren.

Der hier vorliegende Konferenzband stellt Beiträge zur ARC 2012 in Nürnberg vor. Die Beiträge sind i.d.R. in Englisch und folgen international üblichen Richtlinien zur Formatierung (hier nach Vorgaben des IEEE). Der Studienplan des Forschungsmasters wird in Bild 3 schematisch zusammengefaßt. Die Forschungsmethoden und -Strategien stellen dabei eine völlig neue Lehrform dar und bilden zusammen mit den Seminaren in den 3 Semestern die hochschulübergreifenden Veranstaltungen. Informationen zum Studiengang finden Sie auf den Webseiten der Hochschulen und zukünftig auch auf:

Webseite (in Aufbau): **www.forschungsmaster.de**
 Kontaktadresse: **MAPR@ohm-hochschule.de**

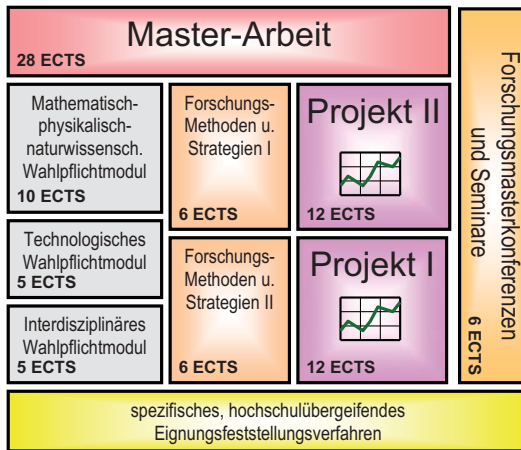


Bild 3: Struktur des Studiengangs

Tabelle: Fächerkatalog, Lehraufwand und Kreditpunkte

	Lehrmodule	SWS	ECTS
1	Mathem.- phys.-naturw. Wahlpflichtmodul	8	10
2	Forschungsmethoden und -Strategien 1	6	6
3	Technologisches Wahlpflichtmodul	4	5
4	Interdisziplinäres Wahlpflichtmodul	4	5
5	Forschungsmethoden und -Strategien 2	6	6
	Forschungsmodule, Abschlußarbeit		
6	6.1 Projektarbeit 1	10	12
	6.2 Projektseminar 1	2	2
7	7.1 Projektarbeit 2	10	12
	7.2 Projektseminar 2	2	2
8	8.1 Masterarbeit	--	28
	8.2 Master-Seminar	2	2
	SWS / Leistungspunkte insgesamt	54	90

Organizer and Sponsors



Georg-Simon-Ohm Hochschule Nürnberg

www.ohm-hochschule.de



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Prof. Dr. Olaf Ziemann, University of Applied Sciences Nürnberg

Conference Program ARC 2012

Applied Research Conference

Villa Leon, Schlachthofstraße/Philipp-Körber-Weg 1, Nürnberg

Lectures will be given in:

Großer Saal
Großer Saal
Kleiner Saal

1st conference day, 25 th June 2012			
8:15 – 9:00	Registration		
9:00 - 9:25	Greeting University of Applied Sciences Nuremberg and Regensburg (Hochschulen Nürnberg und Regensburg) Greeting Conference Chair Prof. Dr.-Ing. Olaf Ziemann, Prof. Dr. Jürgen Mottok		
9:25 – 10:00	Keynote Prof. Dr. Georg Scharfenberg		
10:00 – 10:15	Coffee break		
10:15 - 11:45	Session 1: Embedded Software I Chair: Prof. Dr. Jürgen Mottok Genetic Optimization of Real-Time Multicore Systems With Respect to Communication-Based Metrics Stefan Schmidhuber, Michael Deubzer, Juergen Mottok Porting the Microsoft .NET Micro Framework onto an Embedded Operating System Tobias Ellert, Jürgen Mottok The Subway framework - current state and application Mark Centmayer Evaluation of Advanced Security Concepts to Improve the Trustworthiness of x86-Based Systems Karl Leidl, Andreas Grzembera	10:15 – 11:45	Session 2: Optical Technology Chair: Prof. Dr. Olaf Ziemann Investigation of the influence of warming in plastic optical systems and identification of the format conversion error Jeanette Muenderlein Development of a novel optoelectronic distance measurement system Isabell Schessl DRIFT RESEARCH AND COMPENSATION TECHNIQUES FOR A POF STRETCHING SENSOR Sergey Intelman Building a 10-GBit/s Optical Data Transmission Line Over a Distance of 50 km Michael Strobl, Roland Schiek
11:45 – 13:00	Lunch break		
13:00 – 14:30	Session 3: Embedded Software II Chair: Prof. Dr. Jürgen Mottok Overview of the ITEA2-Project AMALTHEA Stefan Schmidhuber, Andreas Sailer, Michael Deubzer, Martin Hobelsberger, Juergen Mottok Migration path for secure and economic smart power grid devices with transitional smart metering support Gerhard Hansch, Christian Staudte, Stephan Gerhager, Rudolf Hackenberg, Jürgen Mottok Feasibility Study of a Build System Performing Automated Builds Based On Model-Based Build Descriptions	13:00 – 14:30	Session 4: E-Mobility and Smart Grid, Renewable Energy I Chair: Prof. Georg Scharfenberg Funktionale und elektrische Sicherheit bei Ladestationen Christoph Schmittner, Jürgen Mottok, Georg Scharfenberg Competence Atlas for save and green road vehicles in the electro mobility cluster Regensburg Daniel Ostermeier, Jürgen Mottok Integration of the Regulated Distribution Transformer into the electricity grid Josef Bogenrieder

	Matthias Nick, Michael Schorer, Jürgen Mottok		
	Requirements Engineering for a Continuous Tool Chain Platform Andreas Sailer, Stefan Schmidhuber, Michael Deubzer, Martin Hobelsberger, Juergen Mottok		Evaluation of Solar DC/DC Charging Concepts in Off-Grid Operation Johannes Urban, Manfred Bruckmann, Andreas Welsch
14:30-15:00	Coffee break		
15:00 - 16:00	Session 5: Embedded Communication Chair: Prof. Dr. Michael Niemetz	15:00 – 16:00	Session 6: E-Mobility and Smart Grid, Renewable Energy II Chair: Prof. Georg Scharfenberg
	Rapid Prototyping Embedded Systems Using Ethernet Boards Marius Strobl		Smart Home Precipitator for biomass-furnaces Thomas Fischer
	Analysis of the influence of Power over Ethernet on the signal quality of Automotive Ethernet Dennis Degueldre		Optimierte Kleinwindenergieanlage mit richtungsunabhängiger Anströmung Jan Rademacher
	Realtime and Performance behaviour of Ethernet on the example of PROFINET Bernhard Heitzer, Jürgen Mottok		E-Wald Fleet Analytics Michael Burghart

2nd conference day, 26th June 2012			
9:00 – 9:15	Greeting PK's representatives		
9:15 – 10:00	Keynote		
10:00 – 10:15	Coffee break		
10:15 – 11:45	Session 7: Measurement Technology I Chair: Prof. Dr. Anton Horn Development of a dual-phase lock-in amplifier on a 16-bit fixed-point digital signal processor Martin Hofmann Characterization of Embedded Resistors for RF Applications Andreas Bauer PPG signal acquisition and analysis on in vitro tooth model for dental pulp vitality assessment Irene Schulz Quicklyzer – A new developed analytical measurement system for online measurements of specific environmental substances Antonia Graf, Michael Bauhuber, Albert Hutterer, Florian Lechner, Monika Argauer, Martina Zitzelsberger, Alfred Lechner and Helmut Hummel	10:15 – 11:45	Session 8: Materials Science I Chair: Prof. Dr. Armin Dietz, Nuremberg Parameter effects on wet ultrafine grinding of ethyl cellulose by agitator bead mill Stefan Schindhelm, Antonio Montes Herrera, Ulrich Teipel Evaluation and Water Resistance of Different Adhesion Promoters for Total Reflected Teflon® AF Layers for Quicklyzer Measuring Cell Martina Zitzelsberger, Monika Argauer, Michael Bauhuber, Michael Betz, Albert Hutterer, Andreas Mikrievskij, Helmut Hummel and Alfred Lechner Simulation of a silicon tip electron source Christian Prommesberger, Christoph Langer, Florian Dams and Rupert Schreiner The influence of different types of fabrics on the fibre volume content and porosity in basalt fibre reinforced plastics Vincent Schmid, Marco Romano and Ingo Ehrlich
11:45 – 13:00	Lunch break		

13:00 – 14:30	Session 9: Measurement Technology II Chair: Prof. Dr. Hans Poisel	13:00 – 14:30	Session 10: Materials Science II Chair: Prof. Dr. Thomas Frey
	A Gesture-Based Automotive HMI Using Binocular Wafer-Level-Cameras Thomas Bock, Jürgen Mottok, Thorsten Köhler		A new production route for tailor-made Buckypaper Alexander Bonet, Jens Helbig and Thomas Frey
	Instrumentierte Kerbschlagprüfung für Kleinproben aus Duplex-Stählen Johannes Wunder		Electrochemical Measurements and Possibilities to Correct the Loss of Temperature Eva Drechsler and Anja Dwars
	A combined method for enabling precision force measurement with strain gauges in a mobile system Maximilian Gerstl, Andreas Grzemba		Analysis of Microelectronic Materials Andreas Stadler
	Optischer Drehübertrager – Konstruktion Philipp Dengler		Refractive index of nanoporous coatings Monika Argauer, Albert Hutterer, Helmut Hummel, Alfred Lechner, Antonia Graf and Martina Zitzelsberger
14:30 - 15:00 Coffee break			
	Light Distribution in a Photobioreactor Johannes Neukum	15:00 – 15:45	Session 12: Materials Science III Chair: Prof. Dr. Thomas Frey
15:22 - 16:30	Session 11: Cross-Sectional Technology Chair: Prof. Dr. Hans Poisel		Dispersion and rheology of functionalized and non-functionalized multi-walled carbon nanotubes in PDMS Moritz Eisenlauer
	Overview on ISO 26262 for developers of safety relevant automotive sub-systems with focus on hardware development Fabian Geiger, Jürgen Mottok		Diminution of mass of different types of fibre reinforcements due to thermal load Vinzent Schmid, Marco Romano, Ingo Ehrlich
	Fichtel-Foot: Current state of the prototypical implementation of an educational game based on the Subway-framework Steffen Walter		
	3-dimensional Vapour-Phase-Soldering used for 3D-MID technology Matthias Eberl	15:45 – 16:20	Session 13: Robotics Chair: Prof. Dr. Armin Dietz, Nuremberg
			Recognition of Human Extremities in Monocular Camera Images for Human-Robot Collaboration Johannes Höcherl, Philipp Nißl, Thomas Schlegl
			Architecture of a Training Simulator for Wheeled Teleoperated Mobile Manipulators Markus Sander
16:45 – 17:00	Closing session and announcement of the venue of ARC 2013 Conference Chair: Prof. Dr. Olaf Ziemann, Prof. Dr. Jürgen Mottok		