Claire PAGETTI

Researcher Director at ONERA
6th January 1975
French
https://www.onera.fr/staff/claire-pagetti

Short Bio

Since 2005, Claire Pagetti is a researcher at ONERA. She holds a chair on the certification of ML-based system in the ANITI institute. She was an assistant professor at ENSEEIHT from 2007 to 2020. She defended her habilitation (HDR) in 2015. From Sept 2004 to May 2005, she was a post-doctoral fellow at INRIA. From Sept 2003 to August 2004, she was temporary assistant professor at the University of Bordeaux. She defended her PHD in 2004 at the Ecole Centrale de Nantes.

Her fields of interest concern the safe implementation of control command avionic applications on avionic platforms. She has contributed to several industrial, European and French projects that lead to several publications, industrial development and a patent. She was responsible of the Torrents cluster and participated to French GDR groups. From September 2016 to August 2017, she was on a sabbatical at TUHH where she worked on WCET-aware compilation of synchronous programs with the WCC compiler.

Research Interests

- Certification:
  - Development of a model-based and software-aided certification framework for aeronautics systems based on multi/many-core architectures.
  - Identification of gaps between current standards and computer vision based systems. Definition of new practices, benchmarks and methodologies.
- Programming of multi and many core platforms taking into account real-time constraints
- Safety assessment of aeronautics systems, application of formal methods

Current Research Programs

- ANITI chair (2019 – 2023 funding French 3AI, certification of machine learning)
- ANR-DFG InterMcore (2023 – 2026) with CEA, TU Dortmund and TU Dresden
- PHYLOG 2 project (2020 – 2024 funding French DGAC, certification of multi and many-core based platforms). Follow up of PHYLOG project (2016 – 2020 funding French DGAC, certification of multi and many-core based platforms) http://w3.onera.fr/phylog/
- PHYDIAS project (2018 – 2021 funding French DGAC, safe and certified implementation of drone)
- SUPER project (2018 – 2021 funding ONERA, certification of vision-based perception systems)

Editorial boards and Program Committees

Chair / Co-chair:

- Chair International Conference on Embedded Software EMSOFT 2023 https://esweek.org/emsoft/
- Vice chair International Conference on Embedded Software EMSOFT 2022 https://esweek.org/emsoft/
- Track chair 27th International Real-Time and Embedded Technology and Applications Symposium RTAS 2021 http://2021.rtas.org
- Brief presentation at RTSS 2020 http://2020.rtss.org/call-for-brief-presentations/
- 9th International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems WATERS 2018 with Arne Hamann http://w3.onera.fr/waters2018/

- 25th International Conference on Real-Time Networks and Systems RTNS 2017 with Enrico Bini http://www.rtns17.org/#page=home
- Workshop on Mixed Criticality Systems WMC 2016 with Sathish Gopalakrishnan https://gsathish.github.io/wmc2016/

Journal reviewer:

- 2011- : Real-time systems journal, ACM Transactions on Embedded Computing, ACM Transactions on Design Automation of Electronic Systems, Progress in Aerospace Sciences, Science of Computer Programming, Journal of Information Security, ACM Transactions on Architecture and Code Optimization

PC member:

- DATE: 2022 https://www.date-conference.com Rank B
- ECRTS : 2015 – 2021, http://www.ecrts.org/ - Rank A
- EMSOFT : 2017 – 2021 http://www.esweek.org/committees/program/emsoft/2017 - Rank A
- ETFA - track 3 : 2015, 2016 http://www.etfa2015.org - Rank B
- RTAS : 2015, 2016, 2017, 2023 http://2017.rtas.org - Rank A
- RTSS : 2015, 2017, 2019, 2021 http://2017.rtss.org - Rank A+
- SAC - track EMBS : 2011 à 2019 http://retis.sssup.it/sac2017/ - Rank B
- MEMOCODE : 2014, 2015, 2018

Scientific committee

- ERTS (EMBEDDED REAL-TIME SOFTWARE AND SYSTEMS congress) 2012 -- 2020

List 5 key publications (in the last 3 years)

1. Iryna De Albuquerque Silva, Thomas Carle, Adrien Gauffriau, Claire Pagetti: ACETONE: Predictable Programming Framework for ML Applications in Safety-Critical Systems. ECRTS 2022
2. Arthur Clavière, Laura Altieri Sambartolomé, Eric Asselin, Christophe Garion, Claire Pagetti:
3. Verification of machine learning based cyber-physical systems: a comparative study. HSCC 2022: 22:1-22:16
4. Iban Guinebert, Andres Barrilado, Kevin Delmas, Franck Galtié, Claire Pagetti: Quality of Fault Injection Strategies on Hardware Accelerator. SAFECOMP 2022: 222-236
5. Kevin Delmas, Claire Pagetti, Thomas Polacsek: Patterns for Certification Standards. CAiSE 2020: 417-432

PhD supervisions or co-supervisions

- Defended: 7
- On going: 5

Teaching activities

MAST ENSEEIHT 2007 to 2020: 96h annual lectures / TD / TP

Prof. Dr. Frank Allgöwer

Universität Stuttgart
Fakultät für Konstruktions-, Produktions- und
Fahrzeugtechnik (Maschinenbau)
Institute for Systems Theory and Automatic Control

Pfaffenwaldring 9
70569 Stuttgart

Germany

Email: frank.allgower@ist.uni-stuttgart.de
Web: www.ist.uni-stuttgart.de/institut/mitarbeiter/Allgoewer
Phone: +49 711 685 67733

Born on May 23, 1962 in Heilbronn-Sontheim (Germany)

Scientific Career

2010 - 2011	Visiting Professor, University of Newcastle, Australia
2003 - 2004	Visiting Professor, UC Santa Barbara, USA
Since 1999	Professor and Director of the Institute for Systems Theory and Automatic Control
1996 - 1999	Assistant Professor for Nonlinear Systems, Department of Electrical Engineering, ETH Zürich, Switzerland
1996	Dr.-Ing. in Control Engineering, Universität Stuttgart
1995 - 1996	Visiting Research Associate at the DuPont Company, Wilmington, DE, USA
1991 - 1992	Visiting Research Associate, California Institute of Technology, USA
1988 - 1995	Research and Teaching Assistant at the Institute for System Dynamics and Automatic Control, Universität Stuttgart
1981 - 1987	Study of Engineering Cybernetics (Technische Kybernetik) and Applied Mathematics at the Universität Stuttgart and UC Los Angeles, respectively.

Selected Scholarships, Awards and Faculty Functions

2017 - 2020	Elected for the Presidency of the International Federation of Automatic Control (IFAC) from 2017-2020
2015	Distinguished Member Award, IEEE Control Systems Society
Since 2014	Head of the Stuttgart Research Centre for Systems Biology SRCSB
2013 - 2015	Vice President for Technical Activities of the IEEE Control Systems Society
Since 2012	Vice President of the DFG
2011	Outstanding Service Award, International Federation of Automatic Control (IFAC)
Since 2009	Head of the Graduate School Simulation Technology of the Stuttgart Research Center for Simulation Technology.
2007	Landeslehrpreis (Teaching Award) of the State Baden-Württemberg
Since 2007	Member of the Executive Board of Directors of the Cluster of Excellence in Simulation Technology

2006	IEEE Distinguished Lecturer
Since 2006	“Vertrauensdozent” of the Studienstiftung des deutschen Volkes
2006	Fellow, International Federation of Automatic Control (IFAC)
2004	Gottfried-Wilhelm-Leibniz der Deutschen Forschungsgemeinschaft
2003 - 2012	Member of the “Fachkollegium Systemtechnik” of the DFG
2002	NaT-Working Preis der Robert Bosch Stiftung
1999 - 2004	Deputy speaker, SFB 412, Universität Stuttgart
Since 1999	Dean of studies for “Technische Kybernetik”, Universität Stuttgart

Ten most important publications

* Publications jointly together with UoA-researchers involved within this IRTG

§ Publications jointly together with USTUTT-researchers involved within this IRTG

A) Published in publication outlets with scientific quality assurance and book publications:

1. Müller, M. A.; Angeli, D.; Allgöwer, F.: On necessity and robustness of dissipativity in economic model predictive control. IEEE Trans. Automat. Control, 60(6), p. 1671–1676, 2015.
2. Brunner, F. D.; Lazar, M.; Allgöwer, F.: Stabilizing model predictive control: On the enlargement of the terminal set. Int. J. Robust and Nonlinear Control, 25(15), p. 2646–2670, 2015.
3. Löhning, M.; Reble, M.; Hasenauer, J.; Yu, S.; Allgöwer, F.: Model predictive control using reduced order models: Guaranteed stability for constrained linear systems, J. Proc. Contr., 24(11), p. 1647-1659, 2014.
4. Yu, S.; Reble, M.; Chen, H.; Allgöwer, F.: Inherent robustness properties of quasi-infinite horizon nonlinear model predictive control, Automatica, 50(9), p. 2269-2280, 2014.
5. Worthmann, K.; Reble, M.; Grüne, L.; Allgöwer, F.: The Role of Sampling for Stability and Performance in Unconstrained Nonlinear Model Predictive Control, SIAM J. Control Optim., 52(1), p. 581-605, 2014.
6. Bayer, F.; Müller, M.A.; Allgöwer, F.: Tube-based Robust Economic Model Predictive Control, J. Proc. Contr., 24(8), p. 1237-1246, 2014.
7. Reble, M.; Quevedo, D.E.; Allgöwer, F.: Control over Erasure Channels: Stochastic Stability and Performance of Packetized Unconstrained Model Predictive Control. Int. J. Robust and Nonlinear Control, 23(10), p. 1151-1167, 2013.
8. Reble, M., Allgöwer, F.: Unconstrained Model Predictive Control and Suboptimality Estimates for Nonlinear Continuous-Time Systems, Automatica, 48(8), p. 1812-1817, 2012.
9. Müller, M. A., Martius, P., Allgöwer, F.: Model predictive control of switched nonlinear systems under average dwell-time, J. Proc. Contr., 22(9), p. 1702-1710, 2012.
10. Mayne, D. Q., Raković, S. V., Findeisen, R., Allgöwer, F.: Robust output feed-back model predictive control of constrained linear systems: Time varying case, Automatica, 45(9), p. 2082-2087, 2009.

B) Other publications

C) Patents

Supervised graduate students since graduation year 2011

Technische Universität Braunschweig

Bio Prof. Dr.-Ing. Rolf Ernst

IDA INSTITUTE OF COMPUTER AND NETWORK ENGINEERING

Rolf Ernst received a diploma in computer science and a Dr.-Ing. (with honors) in electrical engineering from the University of Erlangen-Nuremberg, Germany, in 81 and 87. From 88 to 89, he was a Member of Technical Staff in the Computer Aided Design & Test Laboratory at Bell Laboratories, Allentown, PA. Since 90, he has been a professor of electrical engineering at the Technical University of Braunschweig, Germany. He was Head of the Department of Electrical Engineering from 1999 to 2001.

His research activities include embedded system design and cyber-physical systems. The activities are or have been supported by the German "Deutsche Forschungsgemeinschaft", DFG, (corresponds to the U.S. NSF), by the German BMBF and BMWi, by the European Union, and by industrial contracts, such as from Airbus, Bosch, BMW, Daimler, Draeger, Elektrobit, Ford, GM, Hitachi, Huawei, IAV, Mercedes-Benz, NXP, Intel, Siemens, Thales, Toyota, or Volkswagen. He gave numerous keynotes, invited presentations and tutorials at major international events and contributed to seminars and summer schools in the areas of hardware/software co-design, embedded system architectures, real-time and safety critical systems, and system modeling and verification. Symtavision, a spin-off from his group and now part of DXC Technology, has commercialized the performance analysis and optimization tool, SymTA/S, which is widely used by automotive and other companies throughout the world. He received the Technology Transfer Award 2008 of the Braunschweig Region Chamber of Industry and Commerce, and was an advisor to the German Ministry of Economic Affairs and Climate Action for the high-tech entrepreneurship program EXIST (**www.exist.de** *(https://www.tu-braunschweig.de/http://www.exist.de/)*) from 2006-2016.

He chaired major international events, such as the International Conference on Computer Aided Design of VLSI (ICCAD), EMSOFT, CODES+ISSS, ESWEEK, ECRTS, or the Design Automation and Test in Europe (DATE) Conference&Exhibition, and was Chair of the European Design Automation Association (EDAA), the main sponsor of DATE. For more than 15 years, he has served in many functions of the DFG, as an elected member (Fachkollegiat) and Deputy Spokesperson of the "Computer Science" review board, and as a member of the DFG Senat Committee for Collaborative Research Centers. He represented the DFG at TU Braunschweig as a DFG Liaison Officer from 2012 to 2020. Since 2017, he has been a jury member of the **Gottfried Wilhelm Leibniz Prize** *(https://www.tu-braunschweig.de/https://www.dfg.de/en/funded_projects/prizewinners/leibniz_prize/index.h*

He is an IEEE Fellow, a DATE Fellow, and served as an ACM-SIGDA Distinguished Lecturer. He is a member of the German National Academy of Science and Engineering, **acatech** *(https://www.tu-braunschweig.de/http://www.acatech.de/)*.
He received the **EDAA Achievement Award 2014.** *(https://www.tu-braunschweig.de/http://www.edaa.com/press_releases/PR_lifetime_2014_results.pdf)*

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Design of Embedded and Cyber-physical Systems

IDA INSTITUTE OF COMPUTER AND NETWORK ENGINEERING

Prof. Dr.-Ing. Rolf Ernst
(https://www.tu-braunschweig.de//en/ernst)

1) Embedded System Performance Analysis

CPA (compositional performance analysis) is an approach to formal performance analysis of large embedded systems that has been developed at IDA in many projects over more than 10 years. CPA has been commercialized as SymTA/S by the IDA spin-off, **Symtavision** *(https://www.tu-braunschweig.de/http://www.symtavision.com/)*. SymTA/S is a comprehensive Software-Toolbox for formal performance analysis and optimization of embedded systems. It is used in regular design processes throughout the international automotive industry and has been applied in other domains, such as avionics. Research at IDA continues with new models and analysis techniques using the research tool pyCPA.

- pyCPA *(https://www.tu-braunschweig.de/https://github.com/IDA-TUBS/pycpa)* (Python implementation of Compositional Performance Analysis)
  Publically available, extensible version of CPA, used for ***research at IDA*** *(https://www.tu-braunschweig.de//en/artifacts) and elsewhere*
  Project staff: **Jonas Peeck**, *(https://www.tu-braunschweig.de//en/home/faculty-and-staff/jonas-peeck)*
  Dr. Sophie Quinton (now INRIA), *and many more*

- Typical Worst Case Analysis
  (https://www.tu-braunschweig.de//en/typicalcpa)
  Compositional Performance Analysis (CPA) of typical worst-case system performance
  Project staff: Dr.-Ing. Leonie Köhler (now CARIAD), Dr. Sophie Quinton (now INRIA)
  Funding: Deutsche Forschungsgemeinschaft (DFG), Industry, ended 2021

- **RT-proofs**
  (https://www.tu-braunschweig.de//en/research/projects/rt-proofs)
  Formal proofs for real-time analysis algorithms
  Project staff (IDA): Dr.-Ing. Leonie Köhler, Dr. Borislav Nikolic (now Continental)
  Research collaboration between TU Braunschweig, INRIA, MPI-SWS, Onera and Verimag
  Funding: Deutsche Forschungsgemeinschaft (DFG) and Agence Nationale de la Recherche (ANR), France, ended 2022

Many related projects with industry are executed by the TTZ "Embedded Systems" of the TU Braunschweig innovation center **iTUBS**
(https://www.tu-braunschweig.de/http://www.itubs.de/)

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2) Adaptive, Autonomous, Real-time, and Dependable Embedded Systems

- UNICARagil
  (https://www.tu-braunschweig.de//en/research/projects/unicaragil)
  (Disruptive modular architecture for agile, autonomous vehicle concepts)
  Modelling and analysis of a service oriented software architecture according to hard safety and real-time requirements. Concepts for the deterministic realization of end-to-end latencies focusing on network communication.
  Project research staff (IDA): **Jonas Peeck**,
  (https://www.tu-braunschweig.de//en/home/faculty-and-staff/jonas-peeck)
  Kai Björn Gemlau
  (https://www.tu-braunschweig.de//en/home/mitarbeiter/kai-bjoern-gemlau)
  The Project UNICARagil is a collaboration of 7 Universities, 16 chairs and 6 industrial partners
  Funding: Bundesministerium für Bildung und Forschung (BmBF)

- IPF 2.0
  (https://www.tu-braunschweig.de//en/forschung/ipf-20) (Information Processing Factory)

Reaching the physical limits of semiconductor technology, future integrated circuits will be increasingly hard to operate. In a transatlantic cooperation, the IPF project opens a novel perspective by applying concepts of factory operation to future many-core architectures.
Project research staff (IDA): **Dominik Stöhrmann**, *(https://www.tu-braunschweig.de//en/home/mitarbeiter/dominik-stoehrmann)* **Alex Bendrick** *(https://www.tu-braunschweig.de//en/home/mitarbeiter/alex-bendrick)*, **Nora Sperling** *(https://www.tu-braunschweig.de//en/home/mitarbeiter/nora-sperling)*
The Project IPF is a collaboration of TU Braunschweig, TU München, and University of California, Irvine, USA
Funding: Deutsche Forschungsgemeinschaft (DFG) and National Science Foundation (NSF), USA

- **ERIKA** *(https://www.tu-braunschweig.de//en/research/projects/erika)* (Elektromobilität mit Redundanter Intelligenter Kommunikations-Architektur)
  OFDM based future in-vehicle network
  Project Research staff: Marie-Terese Harnau, **Dominik Stöhrmann** *(https://www.tu-braunschweig.de//en/home/mitarbeiter/dominik-stoehrmann)*
  Collaboration of Industry, Universities and Fraunhofer Society
  Funding: Bundesministerium für Wirtschaft und Klimaschutz (BMWK)

- MC-ADAMS *(https://www.tu-braunschweig.de//en/forschung/projekte/mc-adams)*
  (Many-core Avionics Design, Architecture, Modeling and Simulation)
  New technologies for high-performance many-core architectures for avionics applications
  Project Research Staff: **Anika Christmann** *(https://www.tu-braunschweig.de//en/home/mitarbeiter/anika-christmann)*, **Robin Hapka** *(https://www.tu-braunschweig.de//en/home/mitarbeiter/robin-hapka)*
  Collaboration with TU BS Institut für Flugführung, TU Hamburg
  Funding: Bundesministerium für Wirtschaft und Klimaschutz (BMWK) (Luftfahrtforschung)

3) DFG Research Group "Controlling Concurrent Change (CCC) - ended 2020

In collaboration of 8 TU Braunschweig professors plus Ph.D. students, the DFG funded Research Group CCC pursued a novel

approach to change in critical applications

- Project A1: Architecture and Mechanisms of the Multi-Change Control Layer (MCCL)
  Project lead: **Rolf Ernst**
  (https://www.tu-braunschweig.de//en/ernst)
  IDA Project research staff: Johannes Schlatow

- Project B3: Safety and Availability
  Project lead: **Rolf Ernst,**
  (https://www.tu-braunschweig.de//en/ernst) **Harald Michalik**
  (https://www.tu-braunschweig.de//en/home/mitarbeiter/michalik)
  IDA Project research staff: Mischa Möstl, Björn Fiethe

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4) Embedded Systems for Smart Technologies

- **Spin-off Symtavision (now part of Luxoft)**
  (https://www.tu-braunschweig.de/http://www.symtavision.com/)

Completed Research

(https://www.tu-braunschweig.de//en/research/group-ernst/completed-research)

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Completed Research

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Completed research projects

- **BASIS**
  (https://www.tu-braunschweig.de/http://www.basis-projekt.org/)
  (Building Automation durch ein Skalierbares & Intelligentes System) (EA and DM&DA)
  (engl. Building Automation with a scalable and smart system)
  Networked embedded platform approach integrating building automation, smart energy, and medical/AAL applications
  project description currently only in German
  Project research staff: Dr. Harald Schrom (coordinator), et al.
  Funding: Bundesministerium für Wirtschaft und Energie (BMWi) ended 2020

- **SAFURE**
  (https://www.tu-braunschweig.de//en/research/projects/safure)
  (Safety And Security By Design For Interconnected Mixed-Critical Cyber-Physical Systems) (EA & DM&DA)
  SAFURE targets the design of cyber-physical systems by implementing a methodology that ensures safety and security "by construction".
  Project Research staff: Robin Hofmann (now Scania), Borislav Nikolic (now Continental)
  Funding: EU (H2020)

- **EMC2**
  (https://www.tu-braunschweig.de//en/forschung/projekte/emc2)
  (Embedded multi-core systems for mixed criticality applications in dynamic and changeable real-time environments) (EA and DM&DA)
  ARTEMIS Innovation Pipeline Project
  Project Research Staff: Adam Kostrzewa
  Funding: ARTEMIS (EU/BMBF)

- **ASTEROID**
  (https://www.tu-braunschweig.de//en/research/projects/asteroid) (An Analyzable, Resilient, Embedded Real-time Operating System Design) (EA and DM&DA)
  Design of a many-core operating system with reliable real-time behavior even under hardware faults
  Project research staff: Eberle Rambo (now Apple), Thawra Kadeed, Philip Axer (now NXP)
  Collaboration with Prof. Herman Härtig, TU Dresden

- **IDAMC** *(https://www.tu-braunschweig.de//en/idamc)* (Integrated Dependable Architecture for Many Cores)
  Configurable manycore platform infrastructure used by many projects, such as RECOMP, CERTAINTY, ASTEROID, ARAMIS, EMC2

- **ARAMIS 2**
  (https://www.tu-braunschweig.de/https://www.aramis2.org/)
  (Automotive, Railway and Avionic Multicore Systems)
  Multi- and Manycore Architectures for Safety Critical Embedded Systems in Transport Applications (Automotive, Avionics, Trains)
  Project Research Staff: Sebastian Tobuschat (now NXP), Adam Kostrzewa
  Funding: Bundesministerium für Bildung und Forschung (BmBF)
  Funding: Deutsche Forschungsgemeinschaft (DFG), Research Priority Program "Dependable Systems"

- ARAMIS
  (https://www.tu-braunschweig.de//en/research/projects/aramis)

- CERTAINTY
  (https://www.tu-braunschweig.de/https://www.certainty-project.eu/)

- Internet-of-Energy *(https://www.tu-braunschweig.de//en/ioe)*

- Modewaves
  (https://www.tu-braunschweig.de//en/research/projects/modewaves)

- Flexelerator
  (https://www.tu-braunschweig.de//en/research/projects/flexelerator)

- **RECOMP**
  (https://www.tu-braunschweig.de//en/research/projects/recomp)

- Virtual Mirror
  (https://www.tu-braunschweig.de//en/research/projects/digital-chameleon)

- Organic Computing (EPOC)
  (https://www.tu-braunschweig.de//en/organic0-1)

- Ekreit *(https://www.tu-braunschweig.de//en/research/projects/ekreit)*

- COMBEST
  (https://www.tu-braunschweig.de/http://www.combest.eu/home/)

- TIMMO-2-USE
  (https://www.tu-braunschweig.de//en/forschung/projekte/timmo-2-use)

- Sureal
  (https://www.tu-braunschweig.de//en/research/projects/sureal)

- **ACCORD** *(https://www.tu-braunschweig.de//en/accord)*

- **AIS**
  (https://www.tu-braunschweig.de//en/research/projects/autonomous-integrated-systems-ais
- **SAKE** *(https://www.tu-braunschweig.de//en/research/projects/sake)*
- **COMPOSE** *(https://www.tu-braunschweig.de//en/compose)*
- **MORPHEUS**
  (https://www.tu-braunschweig.de//en/research/projects/morpheusflexfilm)
- **Wormhole**
  (https://www.tu-braunschweig.de//en/research/projects/wormhole)
- FlexFilm
  (https://www.tu-braunschweig.de//en/research/projects/morpheusflexfilm)
- **Summer Lake**
  (https://www.tu-braunschweig.de//en/forschung/projekte/summer-lake)
- CONAN
- FLEUR: Entwicklung flexibler SoC Entwurfsmethoden
- Entwurf von eingebetteten Hardware/Software-Systemen mit der SPI-Workbench
- Hardware/Software Co-Synthese mit COSYMA
- Rapid Prototyping für Steuerungssysteme mit harten Zeitbedingungen
- Entwurf eingebetteter Systeme für die Mobilkommunikation im EU-Projekt MEDIA
- SymTA/S (ältere Teile) *(https://www.tu-braunschweig.de//en/symtas)*
- Sonderforschungsbereich 420 Flugmesstechnik