

Professor Ing. Pavel Fiala, PhD

<http://orcid.org/0000-0002-7203-9903> Scopus Author ID: 15049262200

<https://www.vut.cz/lide/pavel-fiala-2113#navigace-vizitka>

Date and Place of Birth: 24 March 1964, Kraslice, CZ. Contact details: fialap@vut.cz.

Education and Work Experience

1989 -1990 - Full-time specialist at the Brno Research Institute of Electrical Instruments (VUEP; later renamed Applied Electrical Engineering Co. – IVEP Brno)

1990 – Full-time specialist at the Department of Theoretical and Experimental Electrical Engineering, Faculty of Electrical Engineering, Brno University of Technology

1993 – Deputy director at the Centre for the Modelling and Optimisation of Fields in Electromechanical Systems, a joint project of the Faculty of Electrical Engineering and the company ABB EJV a.s., Brno

1999 – Doctoral degree completion (Ph.D.) at the Faculty of Electrical Engineering and Information Science, Brno University of Technology; defence of doctoral thesis titled "Modelling of Current Transformers with Short Circuit Tests"

2003 – Director of the Department of Theoretical and Experimental Electrical Engineering, Faculty of Electrical Engineering and Communication, Brno University of Technology

2005- Defence of inaugural dissertation titled "Modelling and Design of a Power Pulse Source"

2014- full professor in Theoretical and Electrical Engineering

Scientific and Pedagogical Activities

Research in numerical modelling performed by means of the boundary element method and the finite element method (1986-2003); realisation and application of coupled models within the FEM and FEM/FLM methods, motion models related to free particles bound to macroscopic models, methods of image processing, noise spectroscopy methods, and optoelectronic measurement techniques.

Research in the high-voltage range of heavy-current electrical engineering, mainly within the field of electrical faults and discharges (1988-1990). Modelling of non-linear characteristics of materials (1992-1996); modelling, analysis and optimisation of coupled electromagnetic/thermal/mechanical problems connected with models formulated using concentric parameters (1992-2003); modelling of problems with turbulent flow and an electromagnetic field influenced by chemical composition of materials (2000-2003). Dr. Fiala has built and tested several efficient algorithms for the optimisation of non-trivial problems (1996-now) . Furthermore, he has practiced the modelling and measurement of non-linear material properties – hysteresis (1991-1993), and proposed or realised the design and modelling of power pulse sources (2001-2008 PROTOTYPA a.s.) and power microwave generators (2002-2008 PROTOTYPA a.s, Tesla Vršovice, Institute of Plasma Physics, Academy of Sciences of the CR, Praha). Number of research projects with industrial founding - more than 50, prototypes more than 20, national patents 4, international patents 2.

Project solution – long-time cooperation with ABB EJV s.r.o Brno (1986-now), ELEN Brno 1998, FISCHER- design and analysis of an HV instrument transformer, ELIS s.r.o Brno- design of an atypical induction flowmeter (DN-1000, 2001), PROTOTYPA a.s. Brno – collaboration on the solution of industrial grant programme FD-K/042 “Power Microwave Generators “ (2001-2003), collaboration on programme FT-TA/028 ”Technology of Non-lethal Defence Instruments” (2004-2008), co-solution of project "GENVLN" MO VOP026 s.p. Šternberk (Military Repair Service Facility, Šternberk), a division of the Military Technical Institute of Ground Forces in Vyškov (2006-2008). In addition to participating in numerous other projects, Dr. Fiala has co-authored dozens of instrument transformer designs introduced into production by the ABB EJV Brno, ABB s.r.o. Brno companies. He is the solver of project MPO TIP and co-recipient of grants FR TII/001 “Research and Development of Discharge Activity Detection in Oil-filled Power Transformers“ (2009-2013), FR-TII/368 “Diagnostics of Fast-moving Objects for Security Tests“ (2009-2012), WIRELES SENSINS- WISE, EU 6.FP (2005-2008), , GAČR 102/09/0314 Investigation of Metamaterial Properties and Microwave Structures Utilising Noise Spectroscopy and Magnetic Resonance, GAČR 13-09086S An Investigation of Artificial Electromagnetic Materials and Metamaterials with Applied Numerical and Imaging Methods (2013-2016), International project ENIAC-2012-1 – DeNeCoR - Devices for NeuroControl and NeuroRehabilitation (Project nr 324257, 06.2013-06.2016), GAČR 17-00607S Complex Artificial Electromagnetic Structures and Nanostructures (2017-2020), GAČR 20-14105S Research of atmospheric plasma slit nozzle with complex electromagnetic excitation and plasma chemistry (2019-2021), MPO Development of equipment for remote data transmission and processing in the field of measurement of water, heat and other energy flows using LPWAN network,(01.10.2018-30.06.2020), MPO Development of liquid heating equipment, (01.04.2020- 30.09.2021), MV VI04000071, System for sampling and detection of coronavirus and other respiratory pathogens from air, (01.01.2021-31.12.2022), MPO Development of new test facilities for the measurement of water and heat flow , (30.07.2021 - 31.05.2023).

Academic internships:

25.05.2007 - 30.05.2007, Institut Supérieur D’Electronique de ParisERASMUS Teaching Period

2005-2008, EADS - WIRELES SENSINS- WISE

23.06.2014 - 30.06.2014, Institut Supérieur D’Electronique de ParisERASMUS Teaching Period

Dr. Fiala is a member of the SPIE, APS, IEEE, IEE, OSA, The Electromagnetic Academy, Cambridge, USA (since 2007) and a reviewer of the IEEE Sensors Journal, PIER, PIER&JEMWA USA Cambridge, MDPI, ELSEVIER, OSA, APL

publications in last 5 years (2018-2023)

- International journals with IF > 15
- Conference proceedings= 41
- Total publication (Web of Science) > 190
- Citations (total works), without auto-citations . (Web of Science)... > 299
- Citations. (Google Scholar)..... > 520
- Citations (articles) without auto-citation (Web of Science) > 110
- H-index (Web of Science Thomson Reuters) (2023)..... =13
- H-index (Scopus.com) (2023)..... =13

Applied research projects

ELECTRIC FIELD ANALYSIS IN A HIGH TRANSFORMER WITH 150KV MAXIMUM OPERATING VOLTAGE.	30.12.1996
ANALYSIS AND CALCULATION OF THE ELECTRIC FIELD IN THE TJC7 TRANSFORMER	30.04.1997
ANALYSIS AND CALCULATION OF THE OUTDOOR TRANSFORMER ELECTRICAL FIELD	30.12.1997
MODELING ASSOCIATED TASKS, POWERFUL FREQUENCY TRANSFORMER TRANSFORMER PN = 4KW.	30.08.1998
OPTIMIZATION OF HIGH VOLTAGE COILS IN TWO-POLE TRANSFORMER DESIGNS	19.02.1999
ANALYSIS AND MODELING OF ELECTROMAGNETIC FIELD IN MEASURING TRANSFORMERS	19.02.1999
ELECTROMAGNETIC IMPULSE MICROWAVE GENERATORS.	1.09.2003
ANALYSIS OF ASSOCIATED ELECTROMAGNETIC MODEL OF VOLTAGE OR CURRENT PULSE SOURCE	
ANALÝZA SDRUŽENÉHO ELEKTROMAGNETICKÉHO MODELU PULZNÍHO ZDROJE NAPĚTÍ NEBO PROUDU	30.08.2002
THE CONCEPT AND ANALYSIS OF THE MODEL OF THE POWER-MICROWAVE PERFORMANCE GENERATOR	31.12.2002
TJC6 AND TDC6 TRANSFORMER OPTIMAL DESIGN	31.12.2003
VERIFICATION OF CALORIMETRIC METHOD FOR MEASURING ELECTROMAGNETIC IMPULSE PERFORMANCE	31.12.2003
OPTIMIZING THE CALORIMETRIC METHOD FOR MEASURING THE ACTIVE OUTPUT IMPULSE PERFORMANCE	31.12.2004
SHORT ELECTROMAGNETIC IMPULSE PARAMETERS AND PERFORMANCE MEASUREMENT	31.12.2005
DESIGN AND IMPLEMENTATION OF THE SPECIAL LIGHT SOURCE	31.12.2005
MODELING AND ANALYSIS OF THE ELECTRICAL FIELD OF THE COMBINED SENSOR KEVCR-VARIANT II	01.03.2006
SEMAUTOMATIZED SYSTEM OF EVALUATION OF IMPEDANTS OF VOLTAGE MEASUREMENT TRANSFORMERS	11.09.2006
WORK, CONSULTATION AND MEASUREMENT NECESSARY TO REMOVE TOROID TRANSFORMERS	18.07.2006
MEASURING METHODS OF ULTRA-SHEET IMPULSES	31.12.2007
CURRENT AND VOLTAGE TRANSFORMER SIMULATION	14.12.2006
PROTOTYPE OF DEMAGNETIZING EQUIPMENT OF OPTICAL LAYERS	09.08.2007
DEFORMATION OF THE EQUAL SYSTEM	16.10.2007
MICROWAVE POWER SOURCES	15.11.2007
PULSE GENERATOR MEASUREMENT	31.12.2007
MEASUREMENT OF ELECTROMAGNETIC PERLINING OF PEARL FABRICS	26.11.2007
VOLTAGE TRANSFORMER OPTIMIZATION	02.07.2008
HIGH POWER MICROWAVE SOURCE	28.11.2008
PROPOSAL FOR THE METHOD AND EQUIPMENT FOR MEASURING ELECTRICAL POTENTIAL IN THE DEFINED PROCEDURE OF SAMPLING	07.12.2009
RESEARCH PROBLEM SOLVING IN THE FIELD OF DIAGNOSTICS AND MEASUREMENTS OF ENVIRONMENTS IN THE ENERGY NETWORKS	18.12.2009
STATOR VOLUME INDUCTION HEATING FOR LOSS OF LOSS 10%	31.12.2010
RESEARCH OF SPECIAL SWITCHING SOURCES	31.12.2010
RESEARCH AND EXPERIMENTAL DESIGN OF COOLING ELEMENTS	31.12.2010
LIGHTING POWER SUPPLY WITH LED ELEMENT	31.12.2010
REFERENCE MEASUREMENT OF HIGH FREQUENCY SIGNAL SHIELDING	1.12.2011
DESIGN OF ACOUSTIC DEVICE FOR DETECTION OF WOODEN CHURCHES IN CONSTRUCTION STRUCTURES	31.12.2012
NUMERICAL MODEL, ANALYSIS OF COMPOSITION DISTRIBUTION ELECTROMAGNETIC FIELD, IN RAILS VEHICLE MODEL	26.08.2013
RESEARCH ON THE IMPLEMENTATION OF MEASUREMENT METHODS SUITABLE FOR MOBILE MEASURING METHOD BY REALIZED FORM OF EXPERIMENTAL SAMPLES	31.12.2013
RESEARCH OF MEASURING METHOD OF PV ON 2 MHZ	31.12.2013
RESEARCH PROBLEM SOLVING IN THE FIELD OF DIAGNOSTICS AND MEASUREMENT OF EVENTS IN ENERGY NETWORKS AND EQUIPMENT	31.10.2013
DESIGN OF THE NEW BORN INFRASTRUCTURE REFLECTOR	28.02.2014
DESIGN AND COMPOSITION OF MEASURING SYSTEM OF DIFFERENT EVENTS - PARTIAL SHOCK, BASED ON EVALUATION OF HIGH FREQUENCY ELECTROMAGNETIC SIGNALS	31.12.2013
RISKS OF THE USE OF ELECTROMAGNETIC WEAPONS AGAINST CURRENT INFORMATION AND COMMUNICATION TECHNOLOGIES IN STATE ADMINISTRATION	10.12.2013
RESEARCH AND DEVELOPMENT WORK, CONNECTED WITH A DESIGN OF A NUMERICAL MODEL FOR MAGNETIC AND THERMAL FIELD ANALYSIS	19.02.2014
RESEARCH WORK IN THE FIELD OF NON-DESTRUCTIVE DIAGNOSTICS OF MATERIAL FROM WOOD ELEMENTS IN	15.12.2014

CONSTRUCTION	
IDENTIFICATION OF PARTIAL DISCHARGES IN A CLOSED SPACE WHEN ELIMINATING EXTERNAL INTERFERENCE	15.12.2014
ASSESSMENT OF THE FUNCTIONALITY OF SELECTED INSTRUMENTS AND EQUIPMENT COMPONENTS	15.12.2014
METHODS OF EVALUATION OF ADVERSE EVENTS IN CLOSED ENVIRONMENT AREAS HV, UHV	10.12.2015
RESEARCH AND DEVELOPMENT WORKS IN NUMERICAL MODELING AND PLASMA NOZZLE ANALYSIS	30.06.2015
DEVELOPMENT OF EXPERIENCE, CALCULATION STUDY TO THE PROPERTIES OF THE BUSINESS SYSTEM	30.06.2015
DESIGN OF THE NUMERICAL MODEL AND ACTUATOR ANALYSIS	30.11.2015
RESEARCH AND DEVELOPMENT WORKS IN NUMERICAL MODELING AND ANALYSIS PARAMETRIC PLASMA NOZZLES	30.09.2015
DESIGN OF A NUMERICAL MODEL AND ANALYSIS "SHEET METAL SENSOR"	15.12.2015
LINEAR DRIVE DESIGN AND CONSTRUCTION (LINPO)	15.06.2016
PLASMA NOZZLE WITH INTEGRATED RF GENERATOR	13.12.2016
RESEARCH WORK OF THE DESIGN OF THE AUTOMATIC DATA COLLECTION CENTER OF VACUUM EQUIPMENT	16.03.2018
EMC ANALYSIS AND EVALUATION EMC 35T MULTI-LINE LOW FLOOR TRAM - CHEMNITZ	14.12.2018
MEASUREMENT AND EVALUATION OF MAGNETIC PROPERTIES OF MATERIAL SAMPLES	13.02.2018
DEVELOPMENT OF PARTIAL DISCHARGE SENSORS IN THE UHF BAND	12.11.2018
DESIGN AND IMPLEMENTATION OF MEASUREMENT OF ELECTROMAGNETIC PROPERTIES OF MATERIALS,	10.10.2018
DEVELOPMENT OF EQUIPMENT FOR REMOTE DATA TRANSMISSION AND PROCESSING IN THE FIELD OF MEASUREMENT OF WATER, HEAT AND OTHER ENERGY FLOWS USING LPWAN	30.06.2020
DESIGN AND IMPLEMENTATION OF ELECTROMAGNETIC PROPERTIES OF MATERIALS II	09.10.2018
FLASH SOURCE FOR XBO LAMP,	06.12.2018
RESEARCH ON ATMOSPHERIC PLASMA SLIT NOZZLE WITH COMPLEX ELECTROMAGNETIC EXCITATION AND PLASMA CHEMISTRY	31.12.2022
DEVELOPMENT OF NANO-LIQUID HEATING EQUIPMENT	30.09.2021
SYSTEM FOR SAMPLING AND DETECTION OF CORONAVIRUS AND OTHER RESPIRATORY PATHOGENS FROM THE AIR	31.12.2022
DEVELOPMENT OF NEW TEST BEDS FOR WATER AND HEAT FLOW MEASUREMENT EQUIPMENT	31.05.2023

Brno, CZ, 17.4.2023