

# RADU CEAUSU

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## CAREER OBJECTIVE

Research and development position involving innovative work on modern systems, components, strategies of Internal Combustion Engines. Using advanced simulation techniques and development of after treatment devices for Diesel engines and/or new control strategies would be my first options.

## RESEARCH SKILLS

- **Over ten years of academic research experience** in the field of internal combustion engines (ICE), including running and development of simulation software, controls and instrumentation.
- **Among the equipment installed and operated:** Common rail Diesel engine test bench with state of the art instrumentation, AVL A/C dynamometer with transient control, AVL fuel mass flow meter, FTIR analyzer, rapid prototyping engine control system (RPECS), ETAS open ECU.
- **Theoretical investigations** include steady state and transient modeling of Diesel engines in C++, Matlab, Wave, GT-Power, engine knock analysis, control strategy, combustion, fuel injection and effects on emissions, emissions during transients, turbo-lag. Academic research also conducted in fundamental fields such as thermodynamics, vibrations, and rotor dynamics.
- **Very strong theoretical background** (applied mathematics & physics, numerical methods and algorithms, advanced system dynamics & controls, electronics & computers, fundamental engineering sciences), good hands-on experience backed up by sound knowledge of advanced modern engine systems and subsystems, including electronic controls
- **Highly motivated** for innovative work. High versatility, good communication and team working skills, fast adaptation to new environment. Ability to handle multiple concurrent projects.
- **Software experience:** WAVE, GT-POWER, STAR-CD, AMESIM-IMAGINE, VS100, AVL control software (PUMA Open), MATLAB, MATHCAD, MAPLE, AUTOCAD, C/C++, FORTRAN, BASIC.
- **Certified training obtained:** STAR-CD, STAR-CD/CHEMKIN, WAVE, AMESIM-IMAGINE.

## EDUCATION

- 2005 Doctor of Philosophy, Mechanical Engineering, Wayne State University (WSU), Detroit, MI (expected graduation December 2005), GPA 3.73 (out of max. 4)  
Dissertation: "Improving Turbocharged Diesel Engines Transient Response"  
Advisor Dr. Dinu Taraza, PhD, SAE Fellow
- 1996 MS, Mechanical Engineering, Politehnica University of Bucharest, Romania  
GPA 10 (out of max. 10)  
Master Thesis: "Modeling the Spark Ignition Process in a SI Engine"  
Advisor: Prof. Nicolae Apostolescu, PhD
- 1995 BS, Mechanical Engineering, Politehnica University of Bucharest, Romania  
GPA (9.95 out of max.10); Head of Graduating Series  
Graduation Thesis: "Pressure Analysis in a Mass Produced Spark Ignition Engine under Knock Operating Conditions"  
Advisors: Prof. C.V. Ferarro, PhD, Prof. N. Apostolescu, PhD, As. Prof. F. Millo, PhD

## **RESEARCH EXPERIENCE**

### **1999 – 2005 Graduate Research/Teaching Assistant, Member of the Center for Automotive Research (CAR), WSU**

- Advisor for the WSU Formula SAE Team – in charge with engine performance simulation in GTPower and calibration (2005)
- Designated person in charge of developing engine models using Ricardo software Wave at the Center of Automotive Research and administrator of Wave applications - main contact for support within WSU (2003-2005)
- Developed detailed models for Diesel engines using commercial software Wave by Ricardo. Predictions of performance, emissions, transient response, injection strategy and other parametric studies. Calibration of model against experimental data. (2003-2005)
- Conducted steady state and transient tests on a Daimler Chrysler/VM Motori 2.5 l Diesel engine. Testing of internal combustion engine response to acceleration, and load changes using flexible ETAS controls (ETK7, VS100, INCA). Developed and tested control algorithms for diesel injection, EGR control and VGT actuation. (2004-2005)
- In charge of setting up and running a new engine test cell – The Transient Testing Laboratory at WSU that was setup and instrumented for the experimental study of transient diesel engine operation. (2000-2002)
- Setup and implemented the RPECS system on the commercial engine, under service agreement with SouthWest Research Institute. Project implied development of code in C, setting up electronic equipment, realization of break out box and all connections, calibrating and running the equipment and code. Basic steady state engine operation was achieved. (Oct 2003- Feb 2004)
- In charge of the upgrade of a 1987 AVL AC dynamometer to the state of the art control system PUMA OPEN 1.0, with transient control capabilities, under guidance of AVLNA. (2001-2002)
- Setup and operated an FTIR system for transient diesel raw exhaust gas analysis. (2000-2002)
- Developed a zero dimensional computer model in C++ for multicylinder turbocharged diesel engine steady state simulation as a directed study under advising of Dr. Dinu Taraza, PhD. Calibrated on commercial engine (6 cylinders Cummins engine). (2000-2001)

### **1995 Exchange Student at “Politecnico di Torino” University, Turin, Italy.**

- Setup data acquisition system and developed computer method for the analysis of various knock indexes on a commercial SI engine
- Analytical method for knock wave frequencies was implemented

## **OTHER WORKING EXPERIENCE**

### **1999-2004 Graduate Teaching Assistant, ME Department, WSU**

- Teaching assistant for “Mechanical Engineering Design” class (Fall and Winter Semesters)
- Teaching assistant for “Thermal Engineering Design” class (Spring-Summer Semester 2000)

### **2000-2005 during Spring-Summer Semesters, Part-Time Faculty, ME Department, WSU**

- Instructor for “Introduction to Mechanical Engineering Design” class
- Advisor for undergraduate directed study in ICE design (2004)

### **1995-1998 Assistant-Instructor and Instructor (since March 1998) with the Mechanics of Materials Department, “Politehnica” University of Bucharest, Romania**

- Teaching seminars and conducting lab sessions in Statics, Mechanics of Materials, Vibrations, Finite Element Methods
- In charge with setting up a vibration laboratory for student practical sessions

## **PUBLICATIONS AND PRESENTATIONS**

- Radu Ceausu, Dinu Taraza, Naeim A. Henein, Wayne State University, Walter Bryzik, U.S. Army, TARDEC – “A Generic, Transient Model of a Turbocharged, Multi-Cylinder, Common-Rail Diesel Engine”, ASME ICE Spring Conference, Chicago, IL, April 2005
- Radu Ceausu – “Analysis and Modeling of Transient Operation of a Turbocharged Diesel Engine using Wave” – Ricardo Software International Users Conference, Detroit, MI, April 2005
- Dinu Taraza, Naeim Henein, Radu Ceausu – “Integration of Engine Systems in a Simulation Model for Transient Operation” – The 11<sup>th</sup> Annual Automotive Research Center Conference, Ann Arbor, MI, May 2005
- George Scarlat, Radu Ceausu, Mircea Rades – “Sorting the Eigenvalues of a Dynamic System by Tracking the Mode” – Dynamics of Machines Conference, Brasov, Romania, May 1997
- Nicolae Enescu, Valentin Ceausu, Radu Ceausu - “An Application of Bessel’s Equation in the Study of Conical Beams” – The 8<sup>th</sup> National Mechanical Vibration Conference, Timisoara, Romania, Nov. 1996
- Radu Ceausu, Nicolae Enescu, Valentin Ceausu – “Study of the Knock Wave in Spark Ignition Engines” – The Acoustics Section of the Romanian Academy Bulletin, Bucharest, Oct. 1996

### **Student Scientific Conferences**

- Radu Ceausu – “A Model of Ignition in Spark Ignition Engines” – ICE Section, Student Scientific Conferences, Bucharest 1996, Third Prize Awarded
- Radu Ceausu – “Thermodynamic Considerations in Biosystems” – Biotechnology Section, Student Scientific Conferences, Bucharest 1994, Best Paper Award
- Radu Ceausu – “An Optimization of Joule-Brayton cycle accounting for the pressure losses” – Thermodynamics Section, Student Scientific Conferences, Bucharest 1994, Second Prize Awarded
- Radu Ceausu – “Monte-Carlo Methods in Numerical Computation of Multiple Integrals” – Mathematics Section, Student Scientific Conference, Bucharest, 1993, Best Paper Award
- Radu Ceausu – “A Polytropic Approach on Analytical Real Gas State Equations” – Thermodynamics Section, Student Scientific Conferences, Bucharest 1993, Distinction Awarded

## **AWARDS AND DISTINCTIONS**

2001	Outstanding Teaching Assistant Award, Wayne State University
1998-1999	Rumble Fellowship Award, Wayne State University
1995	Tempus Scholarship at Politecnico di Torino, Turin, Italy, for preparation of graduation thesis
1993-1996	Awards at student scientific conferences
1993	2 <sup>nd</sup> prize in Thermodynamics Undergraduate Contest
1990	3 <sup>rd</sup> prize at “Traian Lalescu” National Undergraduate Students Math Contest

## **LANGUAGES**

Fluent written and spoken Italian, Romanian (native language). Reading, writing: French

**REFERENCES ARE AVAILABLE UPON REQUEST**