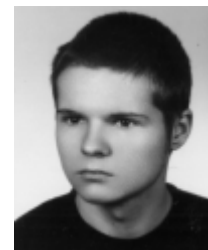


Curriculum Vitae



PERSONAL

Name Maciej MATYKA
Address ul. Krasickiego 3/2, 51-144 Wroclaw, Poland
Email maq@ift.uni.wroc.pl
WWW: <http://panoramix.ift.uni.wroc.pl/~maq/>

RESEARCH INTEREST

- Computational Fluid Dynamics
- Physically based real time simulations
- Modeling and visualization of physical data and processes
- Procedural and object oriented programming (C/C++, Fortan)

EDUCATION

2005-current PhD studies at University of Wroclaw (UWr) at department of Physics and Astronomy (Institute of Theoretical Physics). Computational Physics (diffusion in porous media).
2005 Receive MSc degree in Computational Physics. GPA: **4.5/5.0**. Title: "A study on incompressible fluid phenomena using marker and cell method". Supervised by dr Janusz Szwabinski (UWr).
2004-2005 Continue study at UWr, POLAND
2003-2004 Linköping University, SWEDEN
Exchange Student at Department of Physics and Measurement Technology. Subject studied: Computational Physics,
2000 - 2003 UWr, POLAND
MSc student at Department of Physics and Astronomy. Faculty: Theoretical Physics, Subject studied: Computational Physics.

EMPLOYMENT

2004-current Computational Physicist at Lower Silesian Oncology Center in Wroclaw.
2005 – 2006 Instructor in TIP (eng. IT from basics). Teaching Assistant in mathematical and computer subjects.

AWARDS AND SCHOLARSHIPS

- 2005 Receive the one-time grant from UWr provost with an invitation to start PhD here
- 2001-2005 receive student grant from UWr for very good grades
- 2003 Receive from European Union the SOCRATES scholarship to study Computational Physics during one year at Linköping University in SWEDEN
- IV.2003 – 2nd award in 4th student competition at UWr for Physics Educational Software – program “Soft Body” (real time simulation of soft bodies with 3d visualization)
- III.2002 – 1st award in 3rd student competition at UWr for Physics Educational Software – program “Waves” (numerical solution to wave equation with real time visualization)
- I.2001 – 2nd award in 2nd student competition at UWr for Physics Educational Software – program “Fluid” (Numerical solution to Navier-Stokes equation for free surface flow using Marker-And-Cell Method)

KEY COMPUTATIONAL SKILLS

- Using Software (Matlab, Gnuplot, MS Visual C++ / Dev CPP), Windows/Linux user
- Programming in C/C++/Fortran/PHP/MC 680xx assembler with an ability to learn the new one very fast.

MASTER THESIS

Title: Matyka, M. "A study on incompressible fluid phenomena using marker and cell method", University of Wroclaw (2005)

Short note on the subject of master thesis: I was working with numerical model of the fluid flow based on marker and cell method. I modified original Harlow and Welch approach by using SIMPLE (Semi Implicit Method for Pressure Linked Equations) numerical scheme to discretize Navier--Stokes equations instead of explicit discretization originally used in [1]. Then by using marker and cell approach I was able to find solutions to a set of typical incompressible fluid problems including free surface flows (i.e. the splash of liquid drop).

The main results from the master thesis:

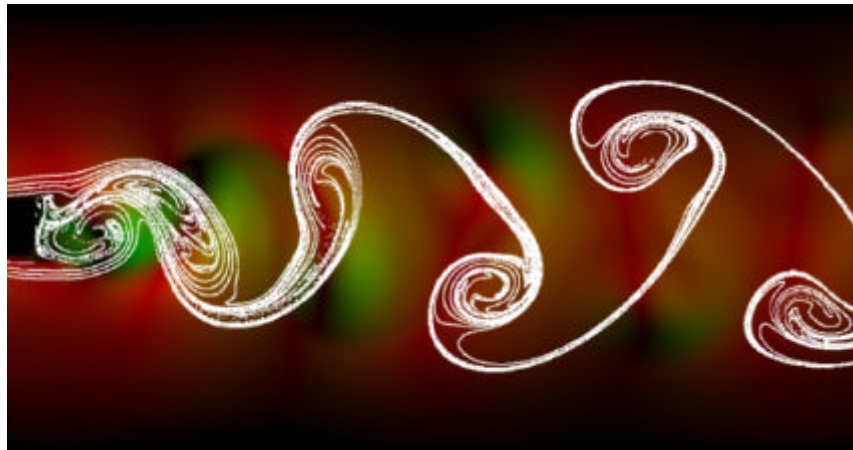


Figure 1. Vortex-Karman street for $Re=220$, visualization done using marker particles, NS equation solved using SIMPLE algorithm.

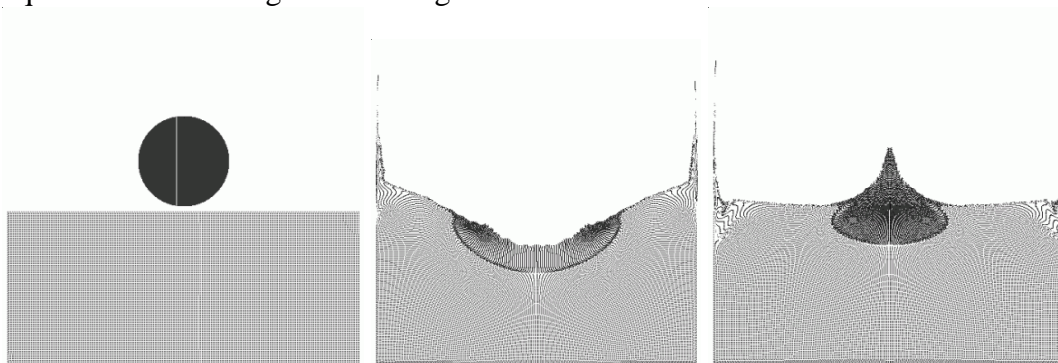


Figure 2. The Splash of Liquid drop. Free surface treating using marker-and-cell approach introduced in [1].

[1] Welch JE, Harlow FH, Shannon JP, Daly BJ. "The MAC Method A Computing Technique for Solving Viscous, Incompressible, Transient Fluid-Flow Problems Involving Free Surface", Report LA-3425, Los Alamos Scientific Laboratory, University of California, 1965.

PUBLICATIONS

TECHNICAL REPORTS

- M. Matyka, "*Incompressible Couette Problem*", CFD (Computational Fluid Dynamics) Course Project Report 1, Linkoping (2003), (preprint: physics/0302010)
- M. Matyka, "*Prandtl-Meyer Expansion Wave*", CFD Course Project Report 2, Linkoping (2003),
- M. Matyka, "*Solution to two-dimensional Incompressible Navier-Stokes Equations with SIMPLE, SIMPLER and Vorticity-Stream Function Approaches. Driven-Lid Cavity Problem: Solution and Visualization.*", CFD Course Project Report 3, Linkoping (2003), (preprint: physics/0407002)

BOOKS

- Maciej Matyka, "*Symulacje Komputerowe w Fizyce*", Helion, Gliwice 2002 (book + CD-ROM, 200 pages, in polish)

BOOKS CHAPTERS

- An article: "*Inverse Dynamic Displacement Constraints in Real-Time Cloth and Soft-Body Models*" in "*Graphics Programming Methods*" book, Charles River (2003)
- An article: "*Practical Animation of Soft Bodies for Game Development: The PSB Model*" in "*Game Programming Gems*", Charles River (2005),

CONFERENCE PROCEEDINGS

- Matyka, M., Ollila, M. "*A pressure model for soft body simulation*", Proc. of Sigrad, UMEA, 2003 (Preprint: physics/0407003)