

Augustinus (Guus) Bertens, MSc.

Profile

I am an applied physics graduate with a great interest in IT and technology. Generally I'd like to apply my knowledge of IT and technology to help solve problems arising in scientific research. My ideal job would be in the area of intersection of experimental physics and IT, for instance by designing and implementing a completely computer-controlled experiment.

Education

- 2012–2015 **Applied Physics MSc.** *Eindhoven University of Technology*, with a specialisation in fluid mechanics. Dissertation: *Droplets and Turbulence*. Experimental analysis of turbulent dispersion of droplets; analysis and improvement of PIV data processing for measuring the turbulent dissipation rate.
- 2011 **Information Security Technology**, *Eindhoven University of Technology, University of Twente, Radboud University Nijmegen*. Completed 24 ECTS towards a Master's degree. Courses included: network security, cryptography, and biometrics.
- 2006–2011 **Applied Physics BSc.**, *Eindhoven University of Technology*, with a minor in Computer Science. Dissertation: *Fluctuation, Dissipation and Turbulence*; experimental analysis of turbulent convection of flow perturbations.

Research

- 2017–present **PhD. project**, *Max-Planck-Institute for Dynamics and Self-organisation*. Experimental measurement of acceleration and relative velocity of micrometric droplets in warm clouds. Cloud droplets illuminated with a pulsed laser and are recorded with high-speed cameras. The shake-the-box PTV algorithm is used to track the droplets, after which velocity and acceleration statistics are computed.
- 2013–2015 **MSc. project**, *Fluid dynamics labs, Eindhoven University of Technology*. Experimental analysis of turbulent dissipation of droplets. A turbulent flow is created with synthetic jets and is characterised with PIV. It is then seeded with droplets produced by a spinning disc aerosol generator.

Droplet sizes are measured with interferometric particle imaging and droplet dispersion is measured with the phosphorescent tagging technique. Data is acquired using a Photron FastCam and is analysed using several Fortran and Matlab programs.

- 2009–2010 **BSc. project**, *Fluid dynamics labs, Eindhoven University of Technology*. Experimental analysis of turbulent convection of flow perturbations. A perturbed turbulent flow is created in a wind tunnel using an active grid. Hot-wire anemometers are used to measure the evolution of the perturbation. Data is acquired using TUE-DACS hardware and is analysed with several C, Fortran, and Matlab programs.

Publications

- **G. Bertens**, D. van der Voort, H. Bocanegra-Evans, W. van de Water, *Large-eddy estimate of the turbulent dissipation rate using PIV*, Exp. in Fluids 56:89, April 2015.
- H. Bocanegra-Evans, N. Dam, D. van der Voort, **G. Bertens**, W. van de Water, *Measuring droplet size distributions from overlapping interferometric particle images*, Rev. Sci. Instrum. 86, 023709, February 2015.
- H. Bocanegra-Evans, N. Dam, **G. Bertens**, D. van der Voort, W. van de Water, *Dispersion of droplet clouds in turbulence*, Phys. Rev. Lett., 117, 164501, October 2016.

Work experience

- 2016 **HPC Infrastructure Specialist**, *ASML Netherlands B.V.* Linux HPC cluster system administration with Bright Cluster Manager; system monitoring and development of monitoring frontend; network and storage infrastructure; remote visualisation; OpenStack administration.
- 2012–2016 **HPC/Linux system administrator**, *Faculty of Chemistry, Eindhoven University of Technology*. Computing cluster and Linux systems administration and support; end-user support; network administration; procurement and profiling of HPC cluster hardware; web-server administration.
- 2012 **Research intern**, *Max-Planck-Institut für Plasmaphysik, Garching, Germany*. Assessment of the performance of neural net-

works for determining plasma parameters in a tokamak experiment; development of Matlab tooling for aforementioned task.

2011–2012 **IT Services co-worker**, *Faculty of Chemistry, Eindhoven University of Technology*. End-user support in a scientific, customer-centric environment.

2010 **Scientific programmer**, *Fluid dynamics labs, Eindhoven University of Technology*. Development of a rapid PIV software implementation in C, aimed at processing half HD images at 10 fps near real-time on a notebook computer.

Languages: Dutch (mother tongue), English (near fluent), German (intermediate).

Driver's license: Dutch driver's license, category B, since 2006.

Miscellaneous: sports (swimming and climbing); DIY home improvement.

Voluntary work:

- Chairman, student computer association "Stack", 2011–present. Stack is a student computer association and has 80 members. I take care of the usual tasks that a board member has: communication, administration, and organisation. As the chairman I furthermore maintain relationships with other associations, and also develop a long term strategy for Stack.
- Team leader and rental manager, Scouting Oisterwijk, 2005–2011. Scouting Oisterwijk is a an educational organisation with an emphasis on practical outdoor activities and has 100 members. With my team I've educated and entertained children on Saturday afternoons. I planned part of these afternoons, and was responsible for communication with parents. I also functioned as rental manager for 3 years.
- Several voluntary work holidays in the Czech Republic, Latvia and Germany, encompassing mainly manual labour in multicultural groups.

Other skills and interests

IT/Technology: I've always enjoyed computers and programming, and computer networks. Besides the usual office skills, I am fluent in C, Matlab and \LaTeX , and have experience with C++, Fortran, and many more programming and scripting languages. I'm confident with command lines, and with the Git and Subversion version control software.

Programming languages: C, C++, Fortran, Pascal, assembly, and more.

Scripting languages: Matlab, PERL, Python, BASH Shell scripts, Javascript, and more.

Miscellaneous languages: \LaTeX .

Electronics: basic analogue and digital circuit analysis, microcontrollers and embedded programming, soldering.

Teaching: I was a freelance private tutor in secondary school subjects for 3 years. I've helped scholars with mathematics, physics, and chemistry.