

## OLEKSANDR IVANCHENKO

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### SUMMARY

Besides a strong academic background in Engineering Science I have more than five years of experimental and practical experience in Optics and Mechanics. I have designed and developed a unique, miniature laser optical LDV probe for the three velocity component measurements. I have designed a new backflow-free catheter. I have more than six years experience in computational and experimental fluid dynamics, and five years experience in industry as an electro/electronic engineer. I am a self-motivated and disciplined person.

### EDUCATION

PhD in Engineering Science & Mechanics, 2008  
University of Alabama, Tuscaloosa, AL; GPA: 3.94/4.0

MS Engineering Science & Mechanics, University of Alabama, Tuscaloosa, AL,  
2006; Outstanding graduate research assistance and Outstanding Master Degree Award GPA:  
3.91/4.0

BS, Engineering Space Academy at Saint-Petersburg, Russia 1990, department of Electronics,  
GPA 4.73 /5.0

### EXPERIENCE

- Currently (from fall 2008) Post Doc Associate at University of Illinois at Chicago (UIC), Department of Bioengineering , working on research projects about soft tissue deformation during drug delivery, including micro-fluid mechanics, computations and experimental visualization. Also, I am working with DTI and MRI data for brain geometry reconstruction with embedded diffusivity and hydraulic conductivity tensors in the computational meshes for Fluent simulations.
- After PhD completion, Research assistant at Department of Mechanical Engineering (University of Alabama):
  - Fuel/gas mix flow visualization and particle size measurements, PDPA/LDV laser system setup in combustion lab, flow velocity, pressure and density measurements.
  - Improvement of Rainbow Schlieren Deflectometry (RSD) system. Design and improvement broadband Xenon light source and development of LED light sources.
  - Development of new numerical Algorithms for flow field investigation, based on density data.
- Research assistant at Aerospace Engineering and Mechanics Department (University of Alabama 2004-2008):
  - Flow velocity, pressure and density measurements.
  - Working experience with standard laboratory equipment such as gauges, power supplies, oscilloscopes, multi-meters, etc.
  - Hands-on experience in on-table optic alignment and development of miniature optic probes, fiber optics and fiber optic terminators, CCD cameras, photodiodes and photomultipliers.
  - Flow visualization and investigation with RSD system, light color component analysis.
  - Computational analysis (CFD, Fluent) and software development for steady/unsteady flow simulation.
  - Hardware modification and installation, experimental setup development.
  - Working experience with strain gauges, excellent soldering skills.
  - Hands-on working experience with pressured air facilities and compressors. Pressures and load measurements.
  - 3 years CAD and 3-D modeling experience of optical equipments and supersonic nozzles, familiar with SolidWorks.
  - Fracture analysis and FEA experience, crack in flat plate.
  - Proposal and patent writing.
- Two summer semesters 2006 and 2007 teaching assistant at the University of Alabama.
- Four years hands-on experience as a Technical Consultant in electromagnetic compatibility and electromagnetic field measurements for industrial electronic equipment. Test and setup equipment for these measurements.

- Three years hands on experience in the adaptive optic laser system including electronic circuits.
- Three years experience with RF devices and radar.

## COMPUTER SKILLS

AutoCAD, MATLAB, LabVIEW, SolidWorks, FLUENT, Gambit, ANSYS, Tecplot, WEB-Builders, M-Office, LDV/PDPA and PIV softwares, MIMICS.

## Relevant Graduate Level Courses:

Thermodynamics, Computational Fluid Dynamics, Fluid Dynamics, Boundary Layer, Partial Differential Equations, Matrix and Vector Analysis, Theory of Elasticity, Experimental Aerodynamics, Experimental Stress Analysis, Fracture Mechanics, Advanced Statistics, Advanced Dynamics, Theory of E/M field, Electric signals and circuits Theory.

## PUBLICATION AND CONFERENCE

### Published:

1. Oleksandr Ivanchenko, Ergin Esirgomez and Semih Olcmen 'A miniature three-component LDV probe'. MEASUREMENT SCIENCE AND TECHNOLOGY. **vol.18** pp.2014-2020, 2007.
2. Oleksandr Ivanchenko and Semih Olcmen "Experimental Investigation of Supersonic Flow, Counterflow Jet Interaction", AIAA 2008-0739.
3. Pankaj S. Kolhe, Oleksandr Ivanchenko, Aga Agrawal and Semih Olcmen "Experimental Measurement of Density, Pressure and Temperature fields in a Supersonic free jet using Rainbow Schlieren Deflectometry", AIAA 2008-0237.
4. O.Ivanchenko, USSR invention certificates in the area of quantum electronics and adaptive optic system.
5. Oleksandr Ivanchenko, Semih Olcmen, Mahamed Sharif "Experimental and Computational Investigation of Supersonic Counterflow Jet Interaction" AIAA 2008-3725.
6. Oleksandr Ivanchenko. Experimental and Computational Investigation of Supersonic Counter flow Jet Interaction in Atmospheric Conditions., dissertation University of Alabama, 2008
7. Oleksandr Ivanchenko et al., "Stress analysis in the porous media under convection enhanced drug delivery", USNCCM10 .,July 2008
8. Oleksandr Ivanchenko et al., "Experimental studies of poroelasticity in brain phantom gels under infusion." Journal of Biomechanical Engineering **vol.132**,April, 2010
9. Oleksandr Ivanchenko et al.,Patent disclose at UIC., Dual action backflow-free catheter systems
10. Dongning Li, Oleksandr Ivanchenko, Nikhil Sindhwani, Eric Lueshen, and Andreas A. Linninger, Optimal Catheter Placement for Chemotherapy 20<sup>th</sup> European Symposium on Computer Aided Process Engineering – ESCAPE20; © 2010 Elsevier

### In progress:

1. O. Ivanchenko, et al., Analytical solution of the diffusion-convection equation in cylindrical geometry.
2. O. Ivanchenko, et al Methods for determining agent concentration profiles in agarose gel during Convection Enhanced Drug Delivery

- Participated in and presented papers for seven conferences:

- 2007 January, 45<sup>th</sup> Annual AIAA conference in Reno, NV.
- 2007 February, 10<sup>th</sup> Annual GSA Research conference in Alabama.
- 2007 April Regional AIAA conference in Savannah, GA.
- 2008 January, 46<sup>th</sup> Annual AIAA conference in Reno, NV.
- 2008 April, Regional AIAA conference in FL.
- 2008 June, 38<sup>th</sup> AIAA conference in Seattle, WA
- 2009 16-19 July, "Mechanics of biological Tissues" at the 10<sup>th</sup> United States National Congress on Computational Mechanics, in Columbus, OH.

**AFFILIATION:** I am an AIAA member.