**Aurela F. Shehu**
Signal Processing & Communications Lab
Dept. of Computer Engineering & Informatics
University of Patras

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RESEARCH INTERESTS

Computer Vision, Augmented Reality, Digital Image Processing, Pattern Recognition and Machine Learning, Digital Signal Processing, Digital Processing of Biological Signals.

EDUCATION

**University of Patras**, Patras, Greece

M.Eng., Signal Processing and Communication Systems,
October 2009 to December 2011 (estimated)

- Thesis Topic: *"Robust-Low computational complexity camera pose estimation techniques"*
- Advisor: Assistant Professor Emmanouil Psarakis
- GPA 9.2/10 (estimated)

Diploma, Computer Engineering & Informatics,
October 2004 to September 2009

- Diploma Thesis: *"Copy number variation estimation techniques"*
- Advisors:
  Assistant Professor Emmanouil Psarakis, Professor Kostas Berberidis
- GPA 8.16/10

**Musical Background**

Violin Diploma from Municipal Conservatory of Patras          **June 2009**

LANGUAGES

Albanian(Native Language)
Greek(excellent knowledge)
Italian(fair knowledge)
English(excellent knowledge)

- Certificate of Competency in English (ECCE)
- Certificate of Proficiency in English (ECPE)
- TOEFl with score 94/120

| ACADEMIC | Computer Engineering and Informatics Department, University of Patras, Greece. |
| EXPERIENCE | *Research* |

- **Diploma Thesis**                    **September 2008 to September 2009**

Topic : *"Copy number variation estimation techniques"*

Advisors : *Assistant Professor E. Z. Psarakis, Professor K. Berberidis.*

Several problems encountered in the *genomic signal processing* area were studied. The main idea is the conversion of the genomic sequence into an arithmetic sequence creating thus a genomic signal, which will be therefore processed efficiently by exploiting conventional signal processing techniques. At first, we studied the process of DNA nucleotide sequence construction as well as dynamic programming techniques in order to find similar sequences and extract information about the function of the genomic sequence. We were strongly interested in gene prediction, that is to find regions that are responsible for protein coding. In addition, we examined a widely used technology, that of *microarrays*, which gives us the ability of recording, tracking and studying simultaneously a lot of genes. The most interesting problem that came up was that of finding copy number covariances. These variations are related to different diseases and we wish to predict them in advance. The detection of these covariants is done mostly on data that are produced from microarrays.

- **Master Thesis**             **September 2010 to December 2011(expected)**

*Topic* : *"Robust-Low computational complexity camera pose estimation techniques"*

*Advisor* : Assistant Professor E. Z. Psarakis.

The perspective camera pose estimation problem, given known 3D coordinates in the world coordinate system and their correspondent 2D image projections, is known as "Perspective n Point(PnP)" problem. While this problem is more than 150 years old known as exterior orientation problem, there is recent renewed interest because of automated navigation and model-based vision systems. It can be considered as a special case of camera calibration problem because when we study the PnP problem, we consider as known the internal camera parameters and our goal is to find the extrinsic camera parameters in a efficient way. Most significant as well as state of the art techniques which provide solution to camera pose estimation problem are thoroughly studied. We focus on methods in literature which solve the pose estimation problem in a non-iterative way. In addition, efforts are made to develop a new technique which provides a closed-form solution and its computational complexity grows linearly with the number of points n.

*Teaching Assistance*

- **Teaching Assistant**         **September 2010 to February 2011**
  Digital Communications
  Advisor: Professor Kostas Berberidis
- **Teaching Assistant**         **February 2010 to June 2010**
  Signals and Systems Theory
  Advisor: Assistant Professor Emmanouil Psarakis
- **Teaching Assistant**         **February 2010 to June 2010**
  Digital Signal Processing
  Advisor: Assistant Professor Emmanouil Psarakis
- **Teaching Assistant**         **September 2009 to February 2010**
  Applications of Digital Signal Processing
  Advisor: Assistant Professor Emmanouil Psarakis
- **Teaching Assistant**         **September 2009 to February 2010**
  Digital Communications
  Advisor: Professor Kostas Berberidis
- **Teaching Assistant**         **February 2007 to June 2007**
  Undergraduate laboratory of "Digital Design"
  Advisor: Professor George Alexiou

AWARDS
- Graduated as 5th out of approx. 200 students
- Ranking 3rd out of approx. 270 students in the academic year 2007-08 (3rd year of my studies)

COMPUTER SKILLS
- Programming: Java, C, C++, C#, VB, UNIX, SQL
- Web Programming: HTML/XHTML, XML, CSS, PHP, Javascript, AJAX
- Matlab experience: linear algebra, polynomials, Filter Design, statistical signal processing, telecommunications, image and video processing, interact with DSP based boards, Simulink.
- TEX, LATEX, BibTEX, Office and other common productivity packages (for Windows, OS X, and Linux platforms)
- Operating Systems: Microsoft Windows XP/7, GNU/Linux

MATHEMATICAL EXPERTISE
- Linear and Nonlinear Systems Theory
- Probability, Random Variables and Stochastic Processes
- Detection and Estimation Theory
- Pattern Recognition and Machine Learning

PROFESSIONAL EXPERIENCE

**Electronics and Computer Engineer**
*Licensed Electronics and Computer Engineer*         **June 2011 to present**
- Member of the Technical Chamber of Greece
- Web Sites and Databases Designer for small businesses in Greece

**Violin Teacher**
- Municipal Conservatory of Kefalonia island         **October 2009 to June 2010**

- Municipal Conservatory of Kefalonia island         **October 2010 to June 2011**

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| OTHER INTERESTS | **Violin** |
| | • Municipal Conservatory Orchestra member,    **September 2001 to present** |
| | • Violin recitals at many theatres and participation in musical groups : "Mandolin Orchestra of Patras", "Galini", "Animeniacs", "A Compahnia Artistica". |
| | Literature, Cinema |

REFERENCES

**Emmanouil Z. Psarakis** (e-mail: psarakis@ceid.upatras.gr; phone: +30-2610-996969)
- Assistant Professor, Computer Engineering and Informatics Department
  University of Patras

**Kostas Berberidis** (e-mail: berberid@ceid.upatras.gr; phone: +30-2610-996975)
- Professor, Computer Engineering and Informatics Department
  University of Patras
- Head of the Signal Processing and Communications Lab

**Evangelos Dermatas** (e-mail: dermatas@wcl.ee.upatras.gr; phone: +30-2610-996476)
- Assistant Professor, Electrical and Computer Engineering Department
  University of Patras