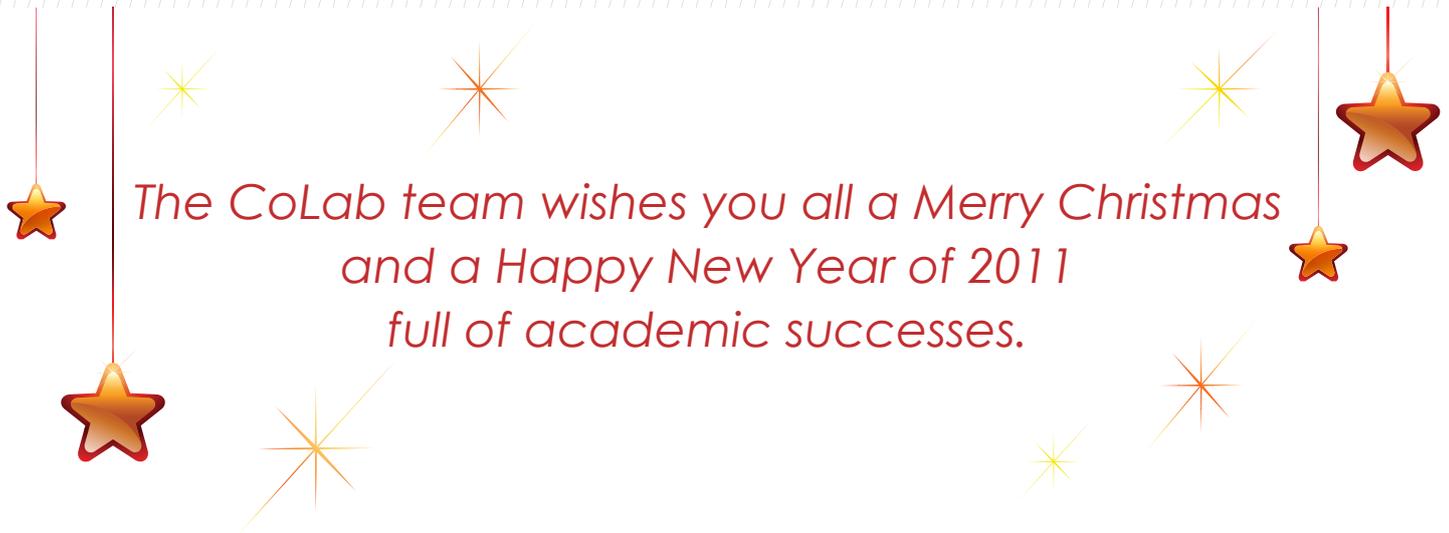


UT Austin | Portugal INTERNATIONAL COLLABORATORY FOR EMERGING TECHNOLOGIES, CoLAB



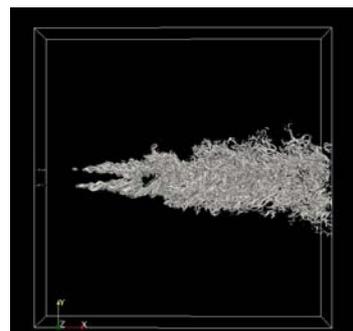
## STUDENT HIGHLIGHT – Diogo Chambel Lopes – Modeling the sub-filter scalar dissipation near the Turbulent/Non Turbulent interface in jets: applications to combustion (Advanced Computing)



Currently in Austin performing part of his PhD research, Diogo is a member of the LASEF research team at IST, Lisbon. Having had a long term interest in Computational Fluid Mechanics, Diogo is now performing Direct Numerical Simulations of turbulent planar jets and studying the phenomena associated with this type of flows.

At this stage of his project, Diogo is also implementing a Low Mach number solution of the Navier-Stokes equations as well as Large Eddy Simulation models, in the parallel version of the planar jet code that is used at his research group, which will permit the simulation of variable density flows using large-eddy simulations (LES).

In LES the large scales of motion are explicitly simulated while the effect of the small scales is modeled. This technique is seen today as the most reliable and accurate technique for the simulation of complex turbulent flows that arise in many engineering



configurations. The main advantage of using these methods is that the computational meshes can be made coarser than the Kolmogorov scale and consequently a great reduction of computational time can be achieved, thus allowing its use in engineering applications.

Given the large computational time that these simulations demand, parallel computation is a must.

Once these tools are in full working order, the entrainment characteristics of the flow and its behavior for different Reynolds numbers will be assessed.

The features that Diogo is putting in place constitute a powerful design aid for many industrial and transportation applications that require the simulation of combustion in jet diffusion flames where the combustion reaction takes place at the edge of the jet which separates the fuel from the oxidizer.

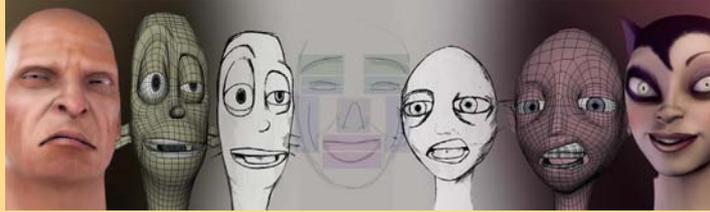
## ■ R&D PROJECT HIGHLIGHT

Project: LIFEisGAME: Learning of Facial Emotions using Serious GAMES

Principal Investigator: Verónica Orvalho

The ability of socially and emotionally impaired individuals to recognize and respond to emotions conveyed by the face is critical to improve their communication skills. The LIFEisGAME project shows how it is possible to apply a pioneer serious game approach to teach people with Autism Spectrum Disorders (ASD) to recognize facial emotions, using real time synthesis and automatic facial expression analysis. Some studies estimate that around 10.000 Portuguese suffer from ASD, and most still use non-interactive methods to learn facial emotions. Our interactive digital media solution has an explicit and carefully thought-out educational purpose within the health care industry: the games will help individuals learn to recognize emotions in a fun way and without inducing stress. New applications in graphics, animation, virtual reality and digital media are enabling the development of different learning-based strategies. Companies like Sony and Microsoft are investing vast resources in the research of new interactive methods for next-generation game consoles, including identification of facial expressions, which will expand the access and the impact of serious games. This joint project between UT Austin and Portugal is a natural fit

for current research interests of the team members and aims to extend them: automatic recognition of human motion, user needs assessment (UT Austin) and facial character animation (Portugal).



The LIFEisGAME project is part of a broader research effort, focusing on an open question of scientific and clinical importance, of whether the use of virtual characters in interactive training programs can provide a basis for ASD rehabilitation. But first, we need to develop the technology.

LIFEisGAME overall objective is to deploy a low cost real time facial animation system embedded in an experimental game, which will allow to further study the symptomatic problems of facial emotion recognition. This will have a relevant impact in: Entertainment Industry (movies, games and new media); Academia (by advancing the state of the art in related research fields); and Psychology (by studying novel interactive approaches using avatars in virtual environments to improve personal interactions).

LIFEisGAME advances the synthesis of realistic virtual characters and markerless motion capture technology, and creates a non-stressful game to help individuals recognize facial emotions in an interactive way.

## ■ DIGITAL MEDIA: Design and Computation Series for the spring

The UT Austin | Portugal Portugal program in digital media is pleased to announce a special **Design and Computation Series** for the spring. The Digital Media team has invited several prominent designers to share talks and/or conduct workshops with students and faculty during the spring semester, 2011. Led by Profs. Nuno Correia (UNL), Rui Prada (IST), and Sharon Strover (UT-Austin), the Lisbon-based series will be a unique opportunity to hear about some of the most interesting, contemporary work in the digital media design field. Students also will have the opportunity to have their work critiqued by the visitors.

**The speakers include:**

**Ernest Adams, UK**

**Anthony Brooks, Denmark**

**Panos Markopoulos, Netherlands**

**Dan Olsen and Peter Hall, Design, University of Texas at Austin**

**Yacov Sharir, Theatre and Dance, University of Texas at Austin**

More details with dates and workshop announcements will be forthcoming.

## ■ FOURTH COLAB External Review Committee meets, with remarkable participation

The Fourth CoLab External Review Committee (ERC) Meeting took place on Foundation for Science and Technology is the last month. From 8th to 11th November the ERC panel met with responsible government officials, as well as the UT Austin | Portugal program directors, students, professors, rectors, deans, researchers, and the UTEN program direction and team.

For four days the External Review Committee, which is composed by a panel of international experts, was gathered for the fourth time with the final goal to provide an independent evaluation of CoLab's work.

The final conclusions and the official reports will be released shortly.

# MEMBERS OF THE DIGITAL MEDIA doctoral program and winners of the “Prémio ZON Criatividade em Multimédia” on their way to Austin

The Digital Media program at UT Austin is looking forward to the arrival of several visitors in the spring semester. Seven members of the Digital Media doctoral program and five winners of the “Prémio ZON Criatividade em Multimédia” prize will be arriving in January to spend several months in Austin as visiting researchers at the University.

During their stay, the visitors intend to audit courses or register for them as official non degree-seeking students. The seven doctoral program students, all from the New University of Lisbon, came to Austin together on a ten-day exploratory visit earlier in the fall to meet with prospective faculty sponsors and discuss their research. They include Luís Frias, planning to work under the supervision of UT film scholar Tom Schatz, Afonso O’Neill, who will work with Gary Chapman of the LBJ School of Public Affairs, and Marta Ferraz Conceição and António Maneira, who intend

to work with members of faculty at the School of Education. Other visiting doctoral students include Paulo Nuno Vicente, working with Rosental Alves, founder and director of the Knight Center for Journalism in the Americas, and students Luís Filipe Gomes and Ana Cabral Martins.

Creators of the award-winning short film “Romeu & Julieta, o Musical” Zara Pinto, Ivo Correia da Silva, and Raquel Laranjo, plan to enroll as students at the University for a semester and take graduate course Writing for Film and Electronic Media as well as audit other courses. Winners in the ZON Prize Multimedia category Cíntia Mendonça Morais and Paulo Cunha Martins will also audit courses relevant to their areas of expertise. The ZON Prize is biggest cash prize awarded in Portugal, inviting individuals and organizations to compete in three categories: Content and Multimedia Applications, Digital Animation and Short Films.

## Students’ expectations



### Luís Frias

*I'm very much looking forward to being in Austin for the spring semester to develop my research prototype and to take advantage of the many opportunities available there. I hope to be able to gain both knowledge and experience and to exchange ideas with others while immersing myself in the rich media culture of the city.*

*I'll be working with Prof. Thomas Schatz of the RTF College of Communication and hopefully collaborating with other Scholars from the College of the Arts - Design Department & the School of Information.*

*My research involves developing a prototype to test interactive media narrative concepts, informed by multi-sensory readings of bio*

*signals. The hypothesis to be proven is that an embodied context aware interaction produces a richer interactive narrative and therefore a more complete experience of reality. Theoretically, from an ethnographic point of view, language interaction is understood as the way in which humans produce a common reality.*

*My approach to narrative aims to augment the notion of language in order to settle the semantic basis for a multi-sensory script. In this way, my research will be to develop a platform that can support formats of multi-sensory media storytelling.*



### Paulo Nuno Vicente

*My aim will be to deepen the Ph.D. research project, directed to the new formats of journalism in the construction of International Reporting narratives. It will be a great time for learning, sharing, networking, partnerships.*

## THE UTEN CORNER

International Workshop@UMinho,  
15-16 November 2010



The 3rd UTEN International Workshop'10 was organized in collaboration with TecMinho, UMinho and UT Austin-Portugal Program, and was held at the University of Minho, Campus de Gualtar, on 15 and 16 November. Under the theme “Nano-Sciences, Research Collaboration & Network Building for Commercialization”, the workshop provided direct training and case studies on the strategic use of equity in the growth of new ventures. The workshop has also examined example startup company equity

## UTEN Portugal

University Technology Enterprise Network

experiences and lessons learned.

Day one of the workshop opened with the session “Trends in NanoSciences: challenges from industry and how universities and research institutes are meeting those needs”. The session’s keynote speaker, Lars Samuelson from Lund University, spoke about “Semiconductor Nanowires: from basic materials physics to IT – and Energy –applications”. This day’s second session focused on “Nano Commercialization and Partnership Opportunities – IP Management”, with a keynote speech by Kirill Kuzmichev, RusNano.

Day two opened with the session “Hands-on Training on Technology Venturing: the use of strategic equity and evaluation of your equity position”, given by Alexander Loesing, Azzurro Semiconductors. The workshop’s second day also focused on the Portuguese Experience in NanoScience Commercialization, with the presentation of the cases of Eco-Ticket, Somatica (both from University of Minho) and Fluidinova. The evaluation of equity position was discussed in the last Hands-on Session. Brian Korgel, Paul Thurk, David Secher and Heath Naquin provided direct training and case studies on the strategic use of equity in the growth of new ventures. Both the investment and entrepreneurial sides of this topic were examined.

## ■ PORTUGAL'S overseas partnerships in academic research featured in the major US newspaper on educational topics, The Chronicle of Higher Education

The journalist Karin Fischer talked with Manuel Heitor, secretary of state for science, technology, and higher education and João Sentieiro, president of the Foundation for Science and Technology, among others about the Portuguese partnerships with American institutions Carnegie Mellon University, Harvard Medical School, the Massachusetts In-

stitute of Technology, and the University of Texas at Austin.

To read the full article please visit:

<http://chronicle.com/article/Portuguese-Universities-Turn/124364/>.

## ■ WACS - Winter Advanced Computing Seminar

The WACS - Winter Advanced Computing Seminar - will open the advanced training activities in 2011, aimed at PhD students in Advanced Digital Media and in Computer Science.

The WACS will take place in Braga at University of Minho, from January 10 to 12; for more details visit:

<http://advcomp.di.uminho.pt/uta/wacs2011/>.

The main goal of this event is to bring to our graduate students expert researchers from Austin, to address issues that are relevant for every software developer in current days: parallelism.

The US speakers are Keshav Pingali (the Director of the Advanced Computing field in CoLab@Austin), Calvin Lin and Martin Burtscher (both also from the Computer Science Department and ICES, in Austin).

The planned agenda for those days follows:

**Monday: 14h00-17h00** (open to a wide audience)

An overview of parallel applications and algorithms  
*Keshav Pingali*

**Tuesday: 16h30-18h00** (targeted to specialists)

Irregular Applications on GPU  
*Martin Burtscher*

**Wednesday:** (open to any CS graduate student interested)

**10h00-13h00:** State of the Art in Parallel Languages (including PGAS)  
*Calvin Lin*

**14h00-15h30h:** GPU programming, as a co-processor device  
*Martin Burtscher*

**15h30-17h00:** Towards a science of parallel programming  
*Keshav Pingali*

## ■ SIMCARD members visit Austin

Research members of the SIMCARD Project, Adélia Sequeira and the postdoc João Soares from IST, Lisbon, have been at UT Austin in the second week of November to collaborate on the framework of the project, with their partners Tom Hughes and Chandrajit Bajaj, from the Institute for Computational Engineering and Sciences (ICES). During their stay, some research meetings with both groups have been scheduled. João Soares presented a talk at one of those meetings and members of Prof. Hughes's group have presented updates of their research. On November 9th, Adélia Sequeira delivered a ICES Seminar entitled '3D

Non-Newtonian FSI Modeling and Simulations of Blood Flow in Arteries'. Other visits of this kind are planned for the near future.

This visit followed a previous one, held last summer for a period of three weeks, by Ángel Rodríguez-Rozas, a student member of the project. Ángel Rozas is a PhD student of the IST -University of Texas at Austin joint doctoral program in Computational Engineering. During his stay in Austin he took part in some UT activities within the group of Prof. T. Hughes, related to the study of Isogeometric Analysis and Applications to Cardiovascular Modeling.

### Useful links

[www.utaustinportugal.org](http://www.utaustinportugal.org)

[www.fct.mctes.pt](http://www.fct.mctes.pt)

[www.utexas.edu](http://www.utexas.edu)

[www.ic2.org](http://www.ic2.org)

[www.ati.utexas.edu](http://www.ati.utexas.edu)

[www.austin-chamber.org](http://www.austin-chamber.org)

<http://colab.ic2.utexas.edu/dm/>

[www.utenportugal.org](http://www.utenportugal.org)

We want to hear from you! Want to share your doubts and concerns about something you read? Want to see other topics featured in next month's newsletter? Want to contribute with articles or art? Please send all your feedback to [carolina.enes@fct.unl.pt](mailto:carolina.enes@fct.unl.pt)

**UT Austin | Portugal**

INTERNATIONAL COLLABORATORY FOR EMERGING TECHNOLOGIES, CoLAB

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