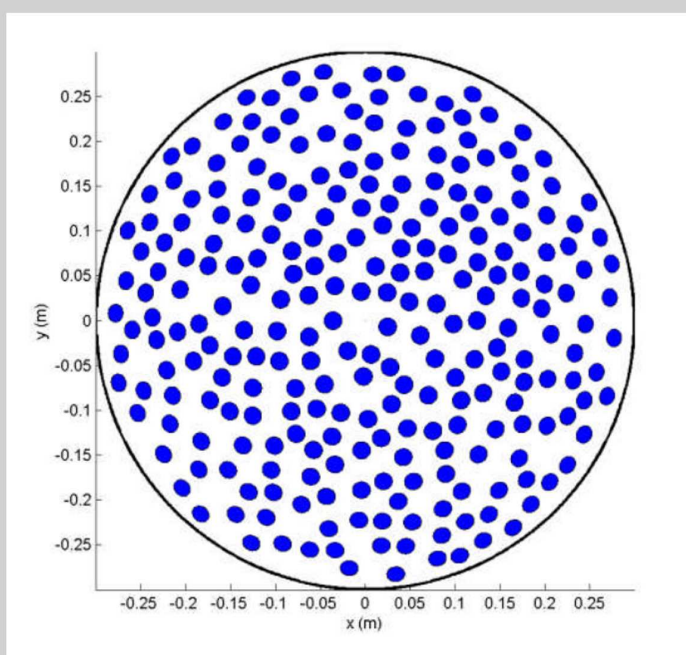




PROGRAMA DE DOCTORADO EN INGENIERÍA CIVIL
MÁSTER DE ESTRUCTURAS

ciencia e ingeniería de estructuras

Treatment Planning for High Intensity Focused Ultrasound (HIFU) ablation of tumours



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Día : Viernes 3 de julio 2015

Hora : 12:30h

Lugar : Seminario I, 4ª planta de la , E.T.S. Ing. Caminos, C. y P.

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Treatment Planning for High Intensity Focused Ultrasound (HIFU) ablation of tumours

The use of High Intensity Focused Ultrasound (HIFU) as a non-invasive therapy option for a range of medical conditions is growing fast. One of the main applications of HIFU is for the destruction of tumours in organs such as the prostate, liver, kidneys and breasts.

The basic concept is to focus a beam of ultrasound to achieve intensities that cause a rapid elevation of temperature above 60°C which after 1-2 seconds leads to coagulative necrosis. To effectively deliver high intensities of ultrasound in regions of the body which might be shadowed by the ribs or be subject to breathing motion poses huge technical challenges.

These challenges can be overcome through careful Treatment Planning based on pre-operative radiographic images of the patient. In this talk, some basic applications for HIFU will be reviewed. The talk will focus on one application which is the ablation of tumours in the liver. Here the main challenges are discussed and some of the main options for Treatment Planning will be presented. The talk will end with some examples of work conducted between UCL and our partners in designing a pre-clinical HIFU system and constructing a Treatment Planning protocol for in-vivo ablation in large animals.

Prof Nader Saffari



Nader Saffari has a BSc in Electrical and Electronic Engineering since 1978, an MSc in Microwaves and Modern Optics, 1980 and a PhD in ultrasound modelling, from UCL since 1984. After completing his studies he worked for six years as an engineering consultant for industrial clients and joined UCL as a lecturer in 1992.

Nader Saffari's research interests include high intensity focussed ultrasound (HIFU) for the ablation of tumours, ultrasound induced neuromodulation, ultrasonic characterisation of biological tissues and biomaterials, mathematical modelling of ultrasound propagation and scattering in inhomogeneous media, ultrasound in functional tissue engineering, characterisation of ultrasound contrast agents for medical diagnostic and therapeutic applications, acoustical imaging and ultrasonic tomography.

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