

# CV (SHORT)

MARCO DANELUTTO

2020

## PERSONAL DATA

Marco Danelutto, born [redacted] He got the PhD in Pisa in 1990 and he is currently full professor at the Dept. of Computer Science of the Univ. of Pisa. He is currently the vice-responsible (“vicepresidente” CdS) of the joint master degree (Univ. of Pisa) in Computer Science and Networking, member of the PhD committee and vice director of the Dept. of Computer Science.

## RESEARCH

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Research activity of Danelutto covers different arguments, mostly in the area of the study of methodologies, tools and models for parallel and distributed computing.

**Structured parallel programming** Danelutto has been a pioneer in the development of *structured parallel programming environments based on algorithmic skeletons*. In early '90s he has been one of the main designers of P3L [2, 3], the first programming language based on the algorithmic skeleton concept. Later on he actively participated in the design and implementation of the industrial version of P3L *SkIE* [4]. In early '2000s, he designed and implemented the structured parallel programming framework Muskel. This was a Java library targeting clusters and workstation networks through algorithmic skeletons. Muskel has been the first algorithmic skeleton programming framework using an autonomic manager to take care of the non functional properties of structured parallel computations [50]. The manager concept has been then used in other programming frameworks including ASSIST [63] and Behavioural skeletons [69, 69]. More recently, Danelutto contributed to the development of the structured parallel programming framework FastFlow [101, 123], that has been adopted in several international research projects including the FP7 EU projects ParaPhrase and REPARA and the H2020 EU funded project RePhrase.

Danelutto contributed to the introduction of algorithmic skeletons in functional programming as well. He participated to the design and implementation of the parallel library OcamlP3L [23], to the design and development of the library ParMap [20] and to the development of libraries for the support of the execution of parallel patterns in Erlang targeting GPUs [125].

He contributed to the development of new parallel patterns, such as the Pool evolution pattern ([25] supporting the implementation of typical parallel computations from the symbolic processing and machine learning application fields) and the Macro Data Flow pattern supporting arbitrary parallel computations modelled through dependency DAGs. Both patterns have been implemented in FastFlow in the framework of the EU FP7 ParaPhrase project.

Eventually, Danelutto contributed to the development of *techniques for the implementation of structured parallel programming environments*: he introduced the implementation model based on macro data flow [5], he contributed substantially to the development of the RISC-pbb model supporting the structured implementation of parallel patterns [115, 22], and participated to the development of techniques

to exploit hardware accelerators within structured parallel programming frameworks [101, 112, 125].

#### SOFTWARE COMPONENTS

Since his participation of the EU funded project CoreGRID (NoE FP6) and GridComp (STREP FP6), Danelutto actively contributed to the development of software component models for structured parallel programming. He contributed to the definition of the standard ETSI GCM (Grid Component Model) [15] and to the design of component models providing structured parallel components [83]. In the GCM framework Danelutto designed, with the other researchers involved in the CoreGRID and GridComp EU projects, Behavioural Skeletons, that is a parallel component model providing several different parallel patterns as components and targeting computational grids and, more generally, cluster/networks of workstations [69, 95].

#### AUTONOMIC COMPUTING

As mentioned, Danelutto introduced in [50] an autonomic manager concept suitable to manage non functional properties of parallel computations (such as performance, fault tolerance, security, energy, etc.). During the participation to EU projects CoreGRID and GridComp, the autonomic management of non functional features concept has been better structured, investigated and formalized in the Behavioural skeleton abstraction [82]. Danelutto first contributed to the design of the Behavioural skeletons and later on actively participated in the development of the structured policies supporting the management of single or multiple non functional properties [91]. Danelutto also contributed to the transfer of the technology proper of Behavioural skeletons from distributed frameworks (grids) to more classical HPC frameworks [97, 103].

#### FORMAL TECHNIQUES FOR THE SUPPORT OF PARALLEL PROGRAMMING

Danelutto has worked on formal techniques for the support of structured parallel programming. At the very beginning of his career, with A. Masini he developed techniques, based on temporal logic, suitable to model the parallel behaviour of different concurrent systems [1, 1]. More recently, he contributed to the formal definition of functional and parallel semantics for algorithmic skeletons [12], he studied formal frameworks supporting the modelling and the analysis of structured parallel programming frameworks [72, 85, 71], as well as model checking based techniques to analyze management policies relative to the management of non functional properties in structured parallel computations [102, 107].

#### FINE GRAIN PARALLELISM

During the PhD and in the following year Danelutto extended the VLIW (Very Long Instruction Word) model designing the model *VLIW-in-the-large* [D1] [4, 7, 10] that was able to overcome some limitations typical of the VLIW programming model, such as those related to possibilities to dynamically adapt the parallelism exploitation (in terms of parallelism degree) to the different features of applications.

#### EDITOR AND CO-EDITOR OF VOLUMES

- co-editor of volume "Euro-Par 2004 Parallel Processing", LNCS, vol. 3149, Springer-Verlag, ISBN: 3-540-22924-8, 2004
- co-editor of volume "Integrated Research in GRID Computing" Springer Science+Business Media, LLC, ISBN: 0-387-47656-3, 2007
- co-editor of volume "Making Grids Work" Springer Science+Business Media, LLC, ISBN: 978-0-387-78447-2, 2008
- co-editor of volume "Proceedings of the 18th Euromicro Conference on Parallel, Distributed and Network-based Processing, PDP 2010", IEEE Computer Society, ISBN: 978-0-7695-3939-3, 2010
- co-editor of volume "Euro-Par 2010 Parallel Processing Workshops" LNCS, vol. 6586, Springer-Verlag, ISBN: 978-3-642-21877-4, 2011
- co-editor of volume "Proceedings of the 19th International Euromicro Conference on Parallel, Distributed and Network-based Processing, PDP 2011" IEEE Computer Society, ISBN: 978-0-7695-4328-4, 2011

- co-editor of volume "Euro-Par 2011: Parallel Processing Workshops", LCNS, vol. 7155, Springer-Verlag ISBN: 978-3-642-29736-6, 2012
- co-editor of volume "Euro-Par 2012: Parallel Processing Workshops", LCNS, vol. 7640, Springer-Verlag ISBN: 978-3-642-36948-3, 2013
- co-editor of the volume "Parallel computing is everywhere", IOS Press, ISBN 978-1-61499-842-6

## INTERNATIONAL CONFERENCES

- responsible of the organization of the conference(s) Euromicro PDP (from 2008)
- member of the Euro-Par steering committee (from 2000 to 2012)
- member of the program committees of the different conferences and workshops including EuroPar (2008, 2010, 2014), Euromicro PDP(2010–2014), CCGRID (2008, 2009, 2014, 2016), HPCN, HPLGPU, IEEE CloudCcom (2012), OrmaCloud (2013–2014), ServiceWave (2008) (2014, 2016), HLPP (2015), ASSSES (2008), CBHPC (2008–2010),
- organizer (co-chair with D. Di Serafino and P. D'ambra) of the mini symposium "Advanced Programming Environments for Parallel and Distributed Computing" associato a ParCo 2001 (Napoli, September 2001)
- organizer (co-chair with M. Vanneschi and D. Laforenza) of "Europar: Parallel Processing 2004" (Pisa, Palazzo dei Congressi, August 2004),
- organizer of "Euromicro 18th Parallel, Distributed and Network.based processing (PDP 2010)" (Pisa, Polo Fibonacci, February 2010),
- co-chair of "Euromicro 19th Parallel, Distributed and Network.based processing (PDP 2011)" (Cipro, February 2011),
- organizer and co-chair with S. Pelagatti and M. Torquati di "HLPP 2015" (Pisa, July 2015).
- organizer and program co-chair (With P. Dazzi) of PARCO 2017 (Bologna, Sept. 2017)

## MAIN INTERNATIONAL COOPERATIONS

### ONGOING

- R. Di Cosmo, Paris VI, France (parallel functional programming)
- P. Kilpatrick, Queen's University, Belfast, UK (formal tools for parallel computing and autonomic computing)
- J. D. Garcia Sanchez, Universidad Carlos 3, Madrid (structured parallel programming frameworks)
- H. G. Velez, NCI, Dublin (IRL) (algorithmic skeletons and cloud computing)
- Luiz Gustavo Fernandez, Dalvan Griebler, PUCRS, Porto Alegre (BRA) (structured parallel programming & software engineering for programming frameworks)

## TEACHING

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Marco Danelutto has been teaching courses at the Univ. of Pisa as assistant or as professor since 1991-92. From 2006 he is in charge of the course of Computer Architecture. From 2009 he also teaches "Parallel and distributed systems: paradigms and models".

He has been providing several courses for the local PhD school, recently in 2007, 2012, 2015 and 2020. In 2018 he also taught a 20h PhD course at PUCRS (Porto Alegre, Brasil).

## PHD SUPERVISOR

- (Co-tutela with M. Vanneschi) Marco Aldinucci (Pisa, PhD in 2003, *Dynamic shared data in structured parallel programming frameworks*)
- Sonia Campa (Pisa, PhD in 2005, *Coordinating exploitation of data and control parallelism*)
- Patrizio Dazzi (IMT Lucca, PhD in 2008, *Tools and Models for High Performance High Level Parallel and Grid Programming*)
- (Co-tutela with Luiz Gustavo Leao Fernandez, Pisa & Pontifica Univ. do Rio Grande do Sul (Brasil)) Dalvan Griebler (Porto Alegre, PhD in 2016, *Domain-Specific Language & Support Tools for High-Level Stream Parallelism*)
- Daniele De Sensi (Pisa, PhD in 2018, *Solutions for Managing Performance and Power Consumption of Parallel Applications*)
- Massimo Torquati (Pisa, PhD in 2019, *Harnessing Parallelism in Multi/Many-Cores with Streams and Parallel Patterns*)

## GRADUATION AND MASTER THESIS SUPERVISOR

From 1992 Danelutto has been

- supervisor of more than 90 graduation and master degree thesis
- supervisor of more than 30 “tirocini formativi” (stage activities of graduation students)

## PUBLICATIONS

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Marco Danelutto is author and co-author of more than 180 papers in international journals and refereed conferences (see appendix).

As of 25 June 2020:

- Scopus reports 180 documents, with more the 180 coauthors, with 1793 total citations by 972 documents, with an H-index equal to 21
- Googl Scholar reports a total of 4532 citations with H-index equal to 35

## A List of publications

### JOURNAL PAPERS

- [1] M. Danelutto and A. Masini. “Implementation of a synchronous communication primitive in a loosely coupled system: a correctness proof”. In: *Future Generation Computer Systems* 8.1–3 (July 1992), pp. 137–147. DOI: 10.1016/0167-739X(92)90035-A.
- [2] M. Danelutto, R. D. Meglio, S. Orlando, S. Pelagatti, and M. Vanneschi. “A methodology for the development and the support of massively parallel programs”. In: *Future Generation Computer Systems* 8.1–3 (1992), pp. 205–220. ISSN: 0167-739X. DOI: [http://dx.doi.org/10.1016/0167-739X\(92\)90040-I](http://dx.doi.org/10.1016/0167-739X(92)90040-I).
- [3] B. Bacci, M. Danelutto, S. Orlando, S. Pelagatti, and M. Vanneschi. “P<sup>3</sup>L: A Structured High level programming language and its structured support”. In: *Concurrency Practice and Experience* 7.3 (May 1995), pp. 225–255. DOI: 10.1002/cpe.4330070305.
- [4] B. Bacci, M. Danelutto, S. Pelagatti, and M. Vanneschi. “SkIE: A heterogeneous environment for HPC applications”. In: *Parallel Computing* 25.13-14 (1999), pp. 1827–1852.
- [5] M. Danelutto. “Efficient support for skeletons on workstation clusters”. In: *Parallel Processing Letters* 11.1 (2001), pp. 41–56.
- [6] P. D’Ambra, M. Danelutto, and D. di Serafino. “Advanced environments for parallel and distributed computing”. In: *Parallel Computing* 28.12 (2002), pp. 1635–1636.
- [7] M. Aldinucci, M. Danelutto, and P. Teti. “An advanced environment supporting structured parallel programming in Java”. In: *Future Generation Computer Systems* 19.5 (July 2003), pp. 611–626. DOI: 10.1016/S0167-739X(02)00172-3.
- [8] M. Danelutto. “HPC the easy way: new technologies for high performance applications deployment”. In: *Journal of Systems Architecture* 49.10-11 (Nov. 2003), pp. 399–419.
- [9] M. Danelutto. “Irregularity handling via structured parallel programming”. In: *Intl. Journal of Computational Science and Engineering* 3-4 (2005).
- [10] M. Aldinucci, M. Coppola, M. Danelutto, N. Tonellotto, M. Vanneschi, and C. Zoccolo. “High level grid programming with ASSIST”. In: *Computational Methods in Science and Technology* 12.1 (2006), pp. 21–32.
- [11] M. Aldinucci and M. Danelutto. “Algorithmic skeletons meeting grids”. In: *Parallel Computing* 32.7 (2006), pp. 449–462. DOI: 10.1016/j.parco.2006.04.001.
- [12] M. Aldinucci and M. Danelutto. “Skeleton based parallel programming: functional and parallel semantic in a single shot”. In: *Computer Languages, Systems and Structures* 33.3-4 (Oct. 2007), pp. 179–192. DOI: 10.1016/j.cl.2006.07.004.
- [13] M. Aldinucci, M. Danelutto, and P. Dazzi. “MUSKEL: an expandable skeleton environment”. In: *Scalable Computing: Practice and Experience* 8.4 (Dec. 2007), pp. 325–341.
- [14] M. Aldinucci and M. Danelutto. “Securing skeletal systems with limited performance penalty: the Muskel experience”. In: *Journal of Systems Architecture* 54.9 (Sept. 2008), pp. 868–876. DOI: 10.1016/j.sysarc.2008.02.008.
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## PHD THESIS

- [D1] M. Danelutto, *A massively parallel architecture using VLIW for fine grain parallelism exploitation*, Dottorato in Informatica, Dipartimento di Informatica, Univ. di Pisa, Technical Report TD05/90, 1990

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Università degli studi di Pisa

1989 **Diploma scuola secondaria di secondo grado**  
Liceo Scientifico F. Cecioni Livorno

COMPETENZE PERSONALI

Lingua madre Italiano

Altre lingue

	COMPRESIONE		PARLATO		PRODUZIONE SCRITTA
	Ascolto	Letture	Interazione	Produzione orale	
Inglese	B2	B2	B2	B2	B2

Livelli: A1/2 Livello base - B1/2 Livello intermedio - C1/2 Livello avanzato  
Quadro Comune Europeo di Riferimento delle Lingue

**Competenze comunicative** Possiedo buone competenze comunicative acquisite durante la mia esperienza professionale ed affinate con la partecipazione a corsi di formazione in servizio

**Competenze organizzative e gestionali** Possiedo buone competenze organizzative sviluppate nell'ambito dell'attività quotidiana di coordinamento dei colleghi e borsisti che collaborano alle attività del Servizio Calcolo e Reti della Sezione di Pisa dell'INFN.

**Competenze professionali** System management in vari ambienti operativi: Unix (HP-UX, AIX, Digital), Linux, Windows e sistemi per acquisizione dati real time. Sistemi di autenticazione e autorizzazione basati su LDAP e Kerberos5. Network management.

**Competenze informatiche** Gestione di grosse infrastrutture di Calcolo Scientifico basate su filesystem paralleli (GPFS), sistemi di scheduling delle attività (LSF) e tecnologie di virtualizzazione (Docker, VMWare). Competenze acquisite sia attraverso specifici corsi di formazione e soprattutto attraverso l'attività pluridecennale all'interno del Calcolo della Sezione di Pisa dell'INFN.

Patente di guida A e B

ULTERIORI INFORMAZIONI

Pubblicazioni recenti

- S. Arezzini et al.: Optimization of HEP Analysis Activities Using a Tier2 Infrastructure, 2012 J. Phys.: Conf. Ser. 396 042003 doi:10.1088/1742-6596/396/4/042003
- F. Calzolari et al.: High availability using virtualization, 2010 J. Phys.: Conf. Ser. 219 052017 doi:10.1088/1742-6596/219/5/052017
- R. Alfieri et al.: The HPC testbed of the Italian Grid Infrastructure, 2013 Euromicro Workshop doi: 10.1109/PDP.2013.42
- R. Alfieri et al.: HPC on the Grid: The Theophys Experience, J Grid Computing (2013) 11: 265. doi:10.1007/s10723-012-9223-6
- S. Arezzini et al: INFN-Pisa scientific computation environment (GRID, HPC and Interactive Analysis), 2014 J. Phy.: Conf. Ser., Vol 513, Track 6 doi: 10.1088/1742-6596/513/6/062030
- T. Boccali et al.: Optimization of Italian CMS Computing Centers via MIUR funded Research Projects, 2014 J. Phy.: Conf. Ser., Vol 513, Track 6 doi: 10.1088/1742-6596/513/6/062006
- T. Boccali et al.: An Xrootd Italian Federation, 2014 J. Phy.: Conf. Ser., Vol 513, Track 4 doi: 10.1088/1742-6596/513/4/042013
- S. McKee et al.: Integrating network and transfer metrics to optimize transfer efficiency and experiment workflows, 2015 J. Phy.: Conf. Ser., Vol 664 doi: 10.1088/1742-6596/664/5/052003
- L Alunni Solestizi et al.: Improvements of LHC data analysis techniques at Italian WLCG sites. Case-study of the transfer of this technology to other research areas, 2015 J. Phy.: Conf. Ser., Vol 664 doi: 10.1088/1742-6596/664/3/032006

## Organizzazione conferenze

- G. Caruso et al.: Clusterlive, 2015 J. Phy.: Conf. Ser., Vol 664 doi: 10.1088/1742-6596/664/9/092005
  - E. Mazzoni et al.: Docker experience at INFN-Pisa Grid Data Center, 2015 J. Phy.: Conf. Ser., Vol 664 doi: 10.1088/1742-6596/664/2/02202
- 
- Nel comitato organizzatore locale di "Frontier detectors for frontier physics" a La Biodola, Isola d'Elba per gli anni: 2003, 2006, 2009, 2012, 2015, 2018
  - Nel comitato organizzatore locale di "High Intensity Frontier Workshop" 28 Maggio 1 Giugno 2015, La Biodola, Isola d'Elba, Italy.
  - Nel comitato organizzatore locale di "Vertex 2016" 25-30 Settembre 2016, La Biodola, Isola d'Elba, Italy.

## ALLEGATI



**Curriculum vitae**  
**Maria Giuseppina Bisogni**

Cognome, nome: Bisogni, Maria Giuseppina

Identificatore unico del ricercatore (ORCID): 0000-0002-4886-8891

• **POSIZIONE**

2014 - ad oggi Professore associato, Dipartimento di Fisica, Università di Pisa, Italia

2002 - ad oggi ricercatore associato con incarico di ricerca scientifica dell'Istituto Nazionale di Fisica Nucleare (INFN), Italia

• **ATTIVITÀ DIDATTICA**

2015 - ad oggi Docente del corso di Fisica Applicata, Laurea Specialistica in Odontoiatria e Protesi Dentaria, Università di Pisa, Italia

2014 - ad oggi Docente del corso di Fisica e Statistica medica, Laurea in Medicina e Chirurgia, Università di Pisa, Italia

2004 - ad oggi Docente del corso di Laboratorio di Fisica Medica, Laurea in Fisica, Università di Pisa

• **RESPONSABILITÀ ISTITUZIONALI**

2016 - ad oggi vicedirettore e membro del consiglio della scuola di specializzazione in Fisica Medica, Università di Pisa,

2017 - ad oggi membro e vicepresidente della Commissione di Area 02, Università di Pisa, Italia

2015 - ad oggi membro del consiglio della scuola di dottorato in Fisica, Università di Pisa

2014 - ad oggi membro del consiglio del corso di laurea in Medicina e Chirurgia, Università di Pisa, Italia

2015 - ad oggi membro del consiglio del corso di laurea in Odontoiatria e Protesi Dentaria, Università di Pisa, Italia

2004 - Ad oggi membro del consiglio del corso di laurea in Fisica, Università di Pisa, Italia

2002 - Ad oggi membro del Dipartimento di Fisica, Università di Pisa, Italia

• **COORDINAMENTO DI PROGETTI DI RICERCA RECENTI**

-2018-2020 PETRA PET monitoRing in Adroterapia – (regione Toscana POR FESR 2014 – 2020), Clinical validation of the INSIDE PET monitoring system at CNAO. Partners: INFN Pisa, CNAO – *Responsabile scientifico: Maria Giuseppina Bisogni*

-2016-2018 NEOLITE Nuove tecnologie elettroniche di alimentazione in ambiente ostile (regione Toscana POR FESR 2014 – 2020, 1.88 M€) Project coordinator: CAEN spa, Italy

*Coordinatore scientifico Università di Pisa: Maria Giuseppina Bisogni*

-2013-2016 INSIDE Innovative solutions for Dosimetry in Hadrontherapy (Nazionale, MIUR PRIN2010-2011, PN. 2010P98A75, 1M€) Collaboration: Uni Pisa, Uni Torino, Politecnico Bari, Uni Roma La Sapienza, INFN and CNAO

*Coordinatore scientifico: Maria Giuseppina Bisogni*

-2011-2013 4DMPET "4D-MPET Four Dimension Magnetic Compatible PET module" (Nazionale, INFN, 120 k€) Collaboration: INFN di Pisa, Bari, Perugia, Torino

*Responsabile nazionale: Maria Giuseppina Bisogni*

• **ATTIVITÀ DI RICERCA DEGLI ULTIMI 10 ANNI**

La mia attività è sempre stata al confine tra ricerca fondamentale e applicazione, avendo il tratto caratteristico dello studio dei rivelatori di radiazioni e della loro applicazione alla fisica medica. Ciò mi ha permesso, sin dai primi anni della mia carriera, di ricevere finanziamenti e creare una serie di reti che coinvolgevano università, centri ospedalieri e industrie. Dal 2006, ho iniziato una nuova attività di ricerca che consiste nello sviluppo e l'applicazione alla diagnostica per immagini di un nuovo fotorilevatore, il Silicon Photomultiplier (SiPM). Sono stata partecipante dell'esperimento dell'INFN DASIPM (2006 -2010), che è stato il primo nel nostro paese ad esplorare l'applicazione del SiPM in astrofisica, fisica delle alte energie e imaging medico. In questo progetto ero responsabile del task di imaging medico e il risultato principale raggiunto è stata la produzione e il test dei primi dispositivi SiPM italiani. Ciò è stato fatto in collaborazione con

l'istituto di ricerca FBK-irst che, attualmente, è uno dei principali produttori di SiPM. In quegli anni, ho eseguito anche il primo test di SiPM a temperature criogeniche. Durante l'esperienza DASIPM e negli anni successivi, ho avuto l'opportunità di coordinare il lavoro di un gruppo di giovani ricercatori che sono diventati esperti nel campo dei fotorivelatori a stato solido e dell'imaging medico. Negli anni successivi (2011-2013) sono stata responsabile nazionale del progetto INFN 4DMPET il cui scopo era lo sviluppo di rivelatori PET innovativi basati su cristalli di scintillatori monolitici e SiPM. Il successo dell'esperimento mi ha permesso di proporre l'approccio 4DMPET ad altri progetti. Versioni del modulo 4DMPET adeguatamente adattate vengono utilizzate in uno scanner PET / MR dedicato alle indagini sulle malattie psichiatriche (progetto FP7 EU TRIMAGE) e nel progetto INSIDE. Motivato dalla richiesta di strumentazione MR compatibile dal progetto TRIMAGE, ho proposto e coordinato per UNIPI un progetto (NEOLITE, finanziato dalla regione Toscana programma POR FESR 2014-2020) per lo sviluppo di alimentatori innovativi in grado di operare in campi magnetici di uno scanner MR (fino a 7 T). Il progetto è realizzato in collaborazione con CAEN e AGE Scientific, due PMI italiane molto attive nella strumentazione nucleare e nell'elettronica digitale. Negli anni 2013-2016, sono stata il coordinatore scientifico del più importante progetto di ricerca della mia carriera. INSIDE (INnovative Solutions per dosImetry in haDronthErapy) è stato finanziato per 1 milione di euro dal MIUR nell'ambito del PRIN2010-2011 (PN. 2010P98A75). Lo scopo di INSIDE era lo sviluppo di un sistema di imaging per monitorare la qualità dei trattamenti oncologici durante le sessioni di adroterapia. Dal 2016 INSIDE è in funzione presso CNAO, la più grande struttura di adroterapia in Italia, e sono responsabile del follow-up e della convalida clinica del sistema (progetti PETRA e INSIDE2). INSIDE è stato utilizzato per monitorare per la prima volta il trattamento di un paziente affetto da un tumore della ghiandola lacrimale. Attualmente e' in corso un trial su 40 pazienti oncologici trattati al CNAO con protonterapia e terapia con ioni carbonio per verificare le performance di INSIDE in ambiente clinico.

Pisa, 19/06/2020

Firma

*Olivia Giuseppina Bisogni*