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Institute of Neurosurgery
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CURRENT POSITIONS

Borgo Trento Hospital - University of Verona — **Verona, IT**
Neurosurgeon — 10/2020 - Present

Department of Neurosciences, Biomedicine and Movement Sciences - University of Verona — **Verona, IT**
PhD Candidate — 10/2020 - Present

PAST POSITIONS

Brigham and Women's Hospital – Harvard University — **Boston, MA**
Clinical Fellow in Spinal Neurosurgery — 07/2019 - 07/2020

Computational Neuroscience Outcomes Center – Harvard University — **Boston, MA**
Research Fellow in Neurosurgery — 06/2017 – 07/2020

EDUCATION

University of Padova — **Padova, IT**
Residency Program in Neurosurgery — 08/2013 – 09/2018

Dissertation: *The Effect of Spine Surgery on Patient Mobility. A Digital Phenotyping Pilot Study Using the Smartphone Integrated GPS*

University of Padova Medical School — **Padova, IT**
MD, *magna cum laude* — 10/2006 – 10/2012

Dissertation: *Circumventricular organs visualization in neuro-endoscopic fluorescein angiography*

Undergraduate — **Bassano del Grappa, IT**
Liceo Scientifico – Computer Science Section — 2001-2006

CLINICAL INTERNSHIPS

Vertebral Surgery Department – Oncological and Degenerative Forms Istituto Ortopedico Rizzoli (IOR)	**Bologna, IT** 04/2017
Department of Neurosurgery, Toronto Western Hospital	**Toronto, CA** 09/2014
Department of Orthopedics, Sant'Antonio Hospital	**Padova, IT** 2012
Department of Neurosurgery, Padova University Hospital	**Padova, IT** 2011
Department of Gynecology, Padova University Hospital	**Padova, IT** 2011
Department of Cardiac Surgery, Padova University Hospital	**Padova, IT** 2010
Department of Thoracic Surgery, Padova University Hospital	**Padova, IT** 2010
Department of Immunology, Padova University Hospital	**Padova, IT** 2009

TRAINING COURSES

European Training Course in Neurosurgery: Trauma and Functional session	**Brno, CR** 09/2019
4th New England Master Class in Endoscopic Anterior Skull Base Surgery	**Boston, MA** 05/2019
Using Python for Research. Harvard X Course	**Boston, MA** 03/2019
European Training Course in Neurosurgery: Tumor session	**Dubrovnik, HR** 10/2018
Cadaver Lab in Neurotrauma: Decompressive craniectomy and Cervical spine instability	**Parma, IT** 03/2017
XXIX National Theoretical and Practical Course for Young Neurosurgeons	**Rome, IT** 2015
Cerebral and Ventricular Endoscopy Theoretical and Practical Course	**Napoli, IT** 2014
Pediatric Basic Life Support Course	**Padova, IT** 2011
Red Cross Pre-Hospital Emergency Care Course 2009 – 2011 Volunteer in the Red Cross Pre-Hospital Emergency Care Service	**Padova, IT** 2009

CERTIFICATIONS

Massachusetts Medical License, Limited	07/2019

Educational Commission for Foreign Medical Graduates (ECFMG) Certification	03/2019
USMLE Step II	01/2019
Italian Board of Neurosurgery	09/2018
USMLE Step I	12/2017

ORAL PRESENTATIONS and POSTERS

'An Online Brain Meningioma Database For Deep Learning Image Analysis' **Boston, MA**
Accepted - Poster at the American Association of Neurological Surgery (AANS) Annual meeting
2020 April 25-29, 2020

'Butterfly Glioblastoma - Survival Outcomes In The Contemporary Era' **Boston, MA**
Accepted - Poster at the American Association of Neurological Surgery (AANS) Annual meeting
2020 April 25-29, 2020

'A deep learning algorithm for the automatic segmentation of meningiomas on magnetic resonance imaging' **San Francisco, CA** 2019
Poster at the Congress of Neurological Surgery (CNS) Annual Congress
October 19 - 23, 2019

'The Effect of Spine Surgery on Patient Mobility. A Digital Phenotyping Pilot Study Using the Smartphone Integrated GPS' **Boston, MA** 2019
Poster Presentation at 2019 Computational Neurosciences Outcomes Center Symposium
October 9th 2019

'Natural Language Processing of Clinical Documentation in Patients Undergoing Surgical Intervention for Lumbar Stenosis' **Boston, MA** 2019
Poster Presentation at 2019 Computational Neurosciences Outcomes Center Symposium
October 9th 2019

'A deep learning algorithm for the automatic segmentation of meningiomas on magnetic resonance imaging' **Boston, MA** 2019
Oral Presentation at 2019 Computational Neurosciences Outcomes Center Symposium
October 9th 2019

'A deep learning algorithm for the automatic segmentation of meningiomas on magnetic resonance imaging' **Dublin, IR** 2019
Oral Presentation at 2019 European Association of Neurosurgical Societies Annual Meeting, September 24 - 28, 2019

'The Effect of Spine Surgery on Patient Mobility. A Digital Phenotyping Pilot Study Using the Smartphone Integrated GPS' **San Diego, CA** 2019

Poster at the American Association of Neurological Surgery (AANS) Annual meeting
13-17 April

'Thirty-day Complications after Surgery for Spinal Metastasis in the Neurosurgical Practice: A National Surgical Quality Improvement Program Analysis' **Houston, TX** 2018
Poster at the Congress of Neurological Surgery (CNS) Annual Congress,
6-10 October 2018

'Thirty-day Complications after Surgery for Spinal Metastasis in the Neurosurgical Practice: A National Surgical Quality Improvement Program Analysis' **Chatham, MA** 2018
Poster at the New England Neurosurgical Society (NENS) Annual Congress,
28-30 June 2018

'Intracranial hypertension and osteoblastoma of the temporal bone. A case report' **Vicenza, IT**
Oral presentation at the Italian Neurosurgery Society National Congress, 2014
25-27 Sept 2014

'Giant esophageal hemangioma. A case report' **Padova, IT**
presented at the General Surgery Course, 2011
Medical School, University of Padova

Local Invited Presentations:

2019 'Deep learning MRI analysis and meningiomas: What we need and why we need it', Neurosurgery Research Talk Series, Brigham and Women's Hospital

AWARDS

2019 Award for Best Computational Radiomics Abstract, 2019 Computational Neurosciences Outcomes Center Symposium

2018 Excellence in Innovation, Partner Healthcare Innovation

2012 Cum Laude, University of Padova Medical School

PUBLICATIONS

A. Boaro, J. Leung, H.T. Reeder, F. Siddi, E. Mezzalira, G. Liu, R.A. Mekary, Y. Lu, M. Groff, J.P. Onnela, T.R. Smith: Smartphone GPS signatures of patients undergoing spine surgery correlate with mobility and current gold standard outcome measures. Accepted for publication *Journal of Neurosurgery: Spine*, February 2021

A. Boaro, M. Wells, J. Chi, Y. Lu, T.R. Smith, M.W. Groff, H. Zaidi. A National Surgical Quality Improvement Program Analysis of Postoperative Major and Minor Complications in Patients with Spinal Metastatic Disease, *World Neurosurgery*, 140: e203-e211, 2020

M Mammi, **A. Boaro**, V. Kavouridis, A F.C. Hulsbergen, J T. Senders, WB. Gormley, TR. Smith, O Arnaout, Chapter 9 - Artificial intelligence for management of patients with intracranial neoplasms, Editor(s): Debmalya Barh, *Artificial Intelligence in Precision Health*, Academic Press, 203-230, 2020

F. Coluzzi, J. V. Pergolizzi Jr, E. Giordan, P. Locarini, **A. Boaro**, D. Billeci. Tapentadol prolonged release for managing moderate to severe chronic neck pain with or without a neuropathic component, *Current Medical Research and Opinion*, 36:4, 651-659, 2020 DOI: 10.1080/03007995.2020.1722083

P Calvachi, E Mezzalira, **A Boaro**, A Duey, F Bolivar, R Mekary, T R Smith, L Aglio, W Gormley, The opioid crisis: 18 years of opioid prescriptions in spine patients, *European Journal of Public Health*, Volume 30, Issue Supplement_5, September 2020, ckaa165.1144, https://doi.org/10.1093/eurpub/ckaa165.1144

Boaro A, Harary M, Chukwueke U, Quevedo PV, Smith TR. The neurocognitive evaluation in the butterfly glioma patient. A systematic review. Interdisciplinary Neurosurgery, Volume 18, December 2019, 100512

Kavouridis VK, **Boaro A**, Dorr J, Cho EY, Iorgulescu JB, Reardon DA, Arnaout O, Smith TR. Contemporary assessment of extent of resection in molecularly defined categories of diffuse low-grade glioma: a volumetric analysis. J Neurosurg. 2019 Oct 25:1-11. doi: 10.3171/2019.6.JNS19972. [Epub ahead of print]

Chang K, Beers AL, Bai HX, Brown JM, Ly KI, Li X, Senders JT, Kavouridis VK, **Boaro A**, Su C, Bi WL, Rapalino O, Liao W, Shen Q, Zhou H, Xiao B, Wang Y, Zhang PJ, Pinho MC, Wen PY, Batchelor TT, Boxerman JL, Arnaout O, Rosen BR, Gerstner ER, Yang L, Huang RY, Kalpathy-Cramer J. Automatic assessment of glioma burden: a deep learning algorithm for fully automated volumetric and bidimensional measurement. Neuro Oncol. 2019 Nov 4;21(11):1412-1422. doi: 10.1093/neuonc/noz106.

Zhou H, Chang K, Bai HX, Xiao B, Su C, Bi WL, Zhang PJ, Senders JT, Vallières M, Kavouridis VK, **Boaro A**, Arnaout O, Yang L, Huang RY. Machine learning reveals multimodal MRI patterns predictive of isocitrate dehydrogenase and 1p/19q status in diffuse low- and high-grade gliomas. J Neurooncol. 2019 doi: 10.1007/s11060-019-03096-0. [Epub ahead of print]

Chang K, Bai HX, Zhou H, Su C, Bi WL, Agbodza E, Kavouridis VK, Senders JT, **Boaro A**, Beers A, Zhang B, Capellini A, Liao W, Shen Q, Li X, Xiao B, Cryan J, Ramkissoon S, Ramkissoon L, Ligon K, Wen PY, Bindra RS, Woo J, Arnaout O, Gerstner ER, Zhang PJ, Rosen BR, Yang L, Huang RY, Kalpathy-Cramer J. Residual Convolutional Neural Network for the Determination of IDH Status in Low- and High-Grade Gliomas from MR Imaging. Clin Cancer Res. 2018 Mar 1;24(5):1073-1081

Longatti P, **Boaro A**, Canova G, Fiorindi A. The subependymal microvascular network revealed by endoscopic fluorescence angiography. J Neurosurg Sci. 2018 Mar 1;24(5):1073-1081

Boaro A, Marton E, Mazzucco GM, Longatti P. Osteoblastoma Mimicking an Idiopathic Intracranial Hypertension Syndrome. Pediatr Neurosci. 2017 12(1):87-90.

Canova G, **Boaro A**, Giordan E, Longatti P Treatment of Posttubercular Syringomyelia Not Responsive to Antitubercular Therapy: Case Report and Review of Literature. J Neurol Surg Rep. 2017 78(2): e59-e67.

Fiorindi A, **Boaro A**, Del Moro G, Longatti P Fluorescein-Guided Neuroendoscopy for Intraventricular Lesions: A Case Series Operative Neurosurgery, 2017 Volume 13(2):173-181

Fiorindi A, Gioffrè G, **Boaro A**, Billeci D, Frascaroli D, Sonego M, Longatti P. Banked fascia lata in sellar dura reconstruction after endoscopic transsphenoidal skull base surgery. Journal of Neurological Surgery Part B_Skull Base 2015, 76(4):303-309

Longatti P, Basaldella L, Sammartino F, **Boaro A**, Fiorindi A. Fluorescein-enhanced characterization of additional anatomical landmarks in cerebral ventricular endoscopy. Neurosurgery 2013, 72(5):855-860

EDITORIAL ACTIVITIES

World Neurosurgery

OTHER EXPERIENCES

2020 Participant at Massachusetts Institute of Technology (MIT) 2020 Reality Hack.
Project: *Augmented Reality Guided Brain Tumor Biopsy System for Microsoft HoloLens 2*
Demo Video: https://devpost.com/software/clear-biopsy-guidance

2019 Member of the Thesis Committee in the Master of Science in Pharmaceutical Economics & Policy at Massachusetts College of Pharmacy and Health Sciences

PROJECTS SUBMITTED FOR FUNDING

2020 Title: SMARTphone as monitoring and early intervention system in BRain Oncology - SMART-BRO
Grant Type: Horizon 2020 - European Commission Funding Program
Role: Co-Investigator

2020 Title: BeiweD-U: a smartphone-based, follow-up and early interventional tool for brain tumor patients
Grant Type: R01 - National Institute of Health
Role: Co-Investigator

2019 Title: Augmented Reality Navigation System in Spine Surgery
Grant type: Partners Innovation Discovery Grant
Role: Co-Investigator

2019 Title: Digital-Phenotyping Assessment in Neuro-Oncology in GBM: DANO
Grant type: Horizon 2020 - European Commission Funding Program
Role: Co-Investigator

2018 Title: The Use of Neural Network Machine Learning for Meningioma Detection and Segmentation
Grant type: Partners Innovation Discovery Grant
Role: Senior Investigator

PROFESSIONAL ASSOCIATES

Italian Society of Neurosurgery

European Association of Neurosurgical Societies

American Association of Neurological Surgeons

North American Spine Society