

PHILIPPE BURLINA

Email: p burlina at gmail dot com

Site: resvirtualis.github.io

Intelligent Systems Center / Johns Hopkins University / Applied Physics Laboratory / Principal Scientist
Johns Hopkins University / Dept. of Computer Science / Associate Professor (research)
Johns Hopkins University / School of Medicine, Wilmer Eye Institute / Joint Faculty
Johns Hopkins University / Malone Center for Engineering in Healthcare / Faculty

SUMMARY My work is in the areas of **AI and machine intelligence algorithmic development**, including machine learning, data science, deep learning, and machine vision. My recent projects/areas of focus are: generative models, deepfakes, adversarial machine learning, AI assurance, machine deception, bias and privacy in AI, online machine learning, domain adaptation, low-shot learning, anomaly detection. I am a hands-on tech/team lead for projects that design AI algorithms that are impactful for problems in domains including healthcare, autonomy, and generalized AI. Publications: h-index=29, bit.ly/burl_papers

WORK

- 2004-present: **AI Principal scientist, Intelligent Systems Center/JHU/APL**, Laurel, MD. Hands on tech/team lead and technical contributor on various AI/ML projects. Focused on algorithmic development developing state of the art AI techniques with applications to generalized AI, healthcare, machine vision, and autonomy.
- 2018-present: **Faculty, JHU Malone Center for Engineering in Healthcare**, Baltimore, MD.
- 2012-present **Associate Professor (research), JHU Dept. of Computer Science**, Baltimore, MD.
- 2011-present: **Faculty, JHU School of Medicine**, Baltimore, MD.
- 2006-2011: **Assistant Professor (research), JHU Dept. of Computer Science**, Baltimore, MD.
- 2004-2012: **Section supervisor, JHU/APL**. Laurel, MD, machine vision. Assistant group supervisor, physics and modeling.
- 2002-2004: **Director of Software Development. FileNet (IBM)**, Costa Mesa, CA. Hands on technical lead for group of 25+ software developers/testers/doc writers. Managing a team developing enterprise server-side software platforms for content management, authentication, etc.
- 2000-2002: Co-founder and **Vice-President of Engineering. eGrail**, Bethesda, MD. Technical and people/line manager for 25+ person team of software engineers developing an enterprise content management platform.
- 1997-2000: Co-founder and **R&D technical lead: ImageCorp, Inc.**, College Park, MD. Lead team developing Computer Vision and machine learning systems, Greenbelt, MD.

EDUCATION

- **Ph.D., Electrical Engineering, University of Maryland at College Park, Computer Vision Lab**, Ph.D. Dissertation on AI applied to vehicle navigation, with focus on estimation of 3D structure/obstacle avoidance.
- **M.S., Electrical Engineering, University of Maryland at College Park, Communications and Control**
- **B.S. (Diplome d'Ingenieur), Computer Science, Université de Technologie de Compiègne (UTC), France**
- University of Pennsylvania, Moore School of Engineering, exchange student while at UTC

DOMAIN KNOWLEDGE/CODING/LANGUAGES/OTHER

- **Deep Learning frameworks:** Keras, PyTorch, sci-kit learn and various other python ML and data science packages, Caffe, OpenCV. Matlab.
- **Software Languages/scripts/frameworks:** Python, Matlab, C/C++, PHP, Java, Mathematica.
- **Domain knowledge:** Machine learning, deep learning, data science, large scale data/image/video analysis, machine intelligence, medical AI, biomedical imaging, signal and image processing, multi-media and multi-image

modality exploitation (electro-optic, video, hyperspectral, scanning electron microscopy)
estimation/detection/tracking; Enterprise software systems; content and record management, e-process/workflow management, authentication, authorization, deployment engines.

- **Software development lifecycle (SDLC):** agile, extreme programming.
- **Other frameworks:** LAMP (Linux, Apache, MySQL, PHP), J2EE.
- **Other tools/scm/etc:** PyCharm, eclipse, git, visual studio, Visio, IBM Rational ClearQuest, Seerena TeamTrack, cvs, svn, ...
- **DBMS:** MySQL, MS SQL Server, Oracle, and other

TEACHING

- 2017-present: teaching a graduate class on AI/deep Learning at JHU <https://ep.jhu.edu/programs-and-courses/525.733-deep-vision>
- 2013-2016: taught class on real time machine vision

FOREIGN LANGUAGES Fluent in French and Italian, some Spanish.

PATENTS

Full list: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C21&q=philippe+burlina+patent&btnG=

Selected list:

- Systems and methods for remote tagging and tracking of objects using hyperspectral video sensors (US8295548)
- System and method for automated detection of age-related macular degeneration and other retinal abnormalities (US8896682)
- Automated pneumothorax detection (US Patent 8,914,097, 2014)
- Hyperspectral imaging for detection of skin related conditions (US Patent 8,761,476, 2014)
- Patient-Specific Segmentation, Analysis, and Modeling from 3-Dimensional Ultrasound Image Data (Patent App. 13/609,476, 2012). System and method of managing web content (US20040216084)
- Systems and methods for determining eye glances (US20020176604)
- Content manager integration (US20040225730)
- Ventriculoperitoneal shunt with pressure responsive element (US Patent 9,993,631)
- Object Recognition and Presentation for the Visually Impaired (US Patent App. 15/671,696)

PUBLICATIONS

bit.ly/burl_papers

selected/recent papers:

Burlina, Joshi, Wang, Where's Wally Now? Deep Generative and Discriminative Embeddings for Novelty Detection, *Proc. CVPR (IEEE Conference on Computer Vision and Pattern/main conference paper)*, 2020.

Burlina, Joshi, Pacheco, Liu, Bressler, Assessment of deep generative models, *JAMA Ophthalmology*, 2019

Ting, Liu, Burlina, Xu, Bressler, Wong, AI for medical imaging goes deep, *Nature medicine*, 24 (5), 539, 2018.

Staley, Katyal, Burlina, DRL Based Intelligent Joint Manipulator and Viewing Camera Control for Reaching Tasks and Environments with Obstacles and Occluders, *IJCNN*, 2018.

Burlina, Joshi, Pekala, Pacheco, Freund, Bressler, Automated grading of AMD from color fundus images using DCNNs, *JAMA Ophthalmology*, 2017.

PROFESSIONAL SOCIETY MEMBERSHIP, SERVICE, ORGANIZATION, INVITED TALKS

- Organized and chaired the AIRIA 2018 Workshop on Artificial Intelligence applied to Retinal Image Analysis, held in conjunction with ACCV 2018, Perth, AU, 2018. <https://resvirtualis.github.io/airia2018/>
- Recent invited/keynote presentations: DRRCR 2018, APTOS 2018, U. Kyoto (2018), U. Nagoya (2018), ...
- IEEE: Senior Member
- Technical reviewer for various tech journals (IEEE Trans. Pattern Analysis and Machine intelligence, IEEE TMI, IEEE Trans. Image Processing, IEEE Trans. GRS, MICCAI's Medical Image Analysis,...) and conferences (CVPR, MICCAI, ISBI, IGARS, IEEE Computer Vision and Pattern Recognition)
- Member: Medical Imaging Computing and Computer Assisted Intervention Society.
- NIH Biomedical Imaging Technology Study Section, member, 2014.

HOBBIES: Experimenting with software frameworks, spin cycling, yoga.