PHILIPPE BURLINA

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Principal Scientist, Johns Hopkins University APL Intelligent Systems Center
Associate Professor (research), Johns Hopkins University Dept. of Computer Science

SUMMARY

I lead teams and design deep learning algorithms and systems that are impactful for problems in AI applied to **healthcare and autonomy**. My work is in the areas of **AI and machine intelligence algorithms**, deep learning, machine vision, data science, principally addressing AI robustness and ML assurance problems, including: low-shot learning, anomaly detection, adversarial machine learning, AI bias/fairness, AI privacy, generative models, domain adaptation. I teach, mentor, and publish in impactful journals bit.ly/burl_papers

WORK

- 2012-now: **Principal Scientist, JHU APL Intelligent Systems Center**, Laurel, MD. Lead teams and projects focused on various DL algorithmic development, with focus on AI applications in machine vision, healthcare, and autonomy.
- 2012-now: **Associate Professor** (research), **JHU Dept. of Computer Science,** Baltimore, MD.
- 2018-now: **Faculty**, **JHU Malone Center for Engineering in Healthcare,** Baltimore, MD.
- 2011-now: **Faculty**, **JHU School of Medicine,** Baltimore, MD.
- 2004-2012: **Section supervisor**, **JHU/APL.** Laurel, MD. Line manager and team lead for projects using machine learning applied to machine vision.
- 2006-2011: **Assistant Professor (research)**, **JHU Dept. of Computer Science,** Baltimore, MD.
- 2002-2004: **Director**, **ECM Software Development. FileNet (IBM),** Costa Mesa, CA. Led team of 25+ software developers of an enterprise web content management (ECM) platform.
- 2000-2002: **Vice-President of Engineering**. **eGrail**, Bethesda, MD. Technical lead and line manager for 25+ person team of software engineers developing an enterprise content management platform.
- 1997-2000: **R&D technical lead**: **ImageCorp**, Inc., College Park, MD. Led team developing machine vision and machine learning solutions for healthcare, government, and industry, Greenbelt, MD. Co-founder.

EDUCATION

- **Ph.D., Electrical Engineering, University of Maryland at College Park, Computer Vision Lab.** Ph.D. Dissertation on Computer Vision, focus on visual navigation and autonomy.
- **M.S.**, Electrical Engineering, **University of Maryland at College Park**, Communications and Control
- **B.S.** (Diplome d'Ingenieur), Computer Science, **Université de Technology de Compiegne**, France (incl. one year at University of Pennsylvania, Moore School of Engineering)

DOMAIN KNOWLEDGE, CODING, LANGUAGES, OTHER

- **Deep Learning, machine vision frameworks:** Keras/TensorFLow, PyTorch, python ML and data science packages, Caffe, OpenCV, ...
- **Domain knowledge:** Machine learning, machine vision, AI Assurance, AI robustness, generative models, adversarial AI, AI privacy and fairness, deep learning, machine perception, image/video analysis, machine intelligence, data science, medical image analysis, biomedical imaging, signal and image processing,; Enterprise software; content and record management, e-process/workflow management, authentication, authorization, deployment engines.

- **Software Languages/scripts/frameworks**: Python (and major AI/DL/data science toolboxes), Keras/TensorFlow, PyTorch, Caffe, Matlab, C/C++, PHP, Java, Mathematica.
- **Software development lifecycle (SDLC):** agile, extreme programming.
- **Frameworks:** Linux, Apache, MySQL, PHP, Java EE,
- **SCM/IED/design:** VS code, PyCharm, Visio, git, IBM ClearQuest, TeamTrack,
- **DBMS**: RDBMSs like MySQL, MS SQL, Oracle, and other

PUBLICATIONS

List: bit.ly/burl_papers

Selected list of recent publications:

Burlina et al, *Low shot DL for DR*.., **JAMA Opthalmology**,2020.
Burlina et al, *Assessment of deep generative models*.., **JAMA Ophthalmology**, 2019
Burlina et al, *Deep Generative and Discriminative Embeddings for Novelty Detection*, **CVPR**, 2019.
Ting, Liu, Burlina, et al, *AI for medical imaging goes deep*, **Nature medicine***,* 24 (5), 539, 2018.
Staley, Katyal, Burlina, *DRL Based Intelligent Joint Manipulator and Viewing Camera Control*, **IJCNN**, 2018.
Burlina et al, *Automated grading of AMD from color fundus images using DCNNs***, JAMA Ophthalmology***,* 201

PATENTS

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

Selected list of recent:

Object recognition and presentation for the visually impaired (US10,646,966)
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); Systems and methods for remote tagging and tracking of objects using hyperspectral video sensors (US8295548); 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),…

INVITED TALKS, PROFESSIONAL SOCIETIES, SERVICE, ORGANIZATION

Invited or Keynote talks: 2020 Stanford CCOI, 2018 DRCR, 2018 APTOS, 2018 U. Kyoto (2018) and U. Nagoya
Chair: 2018 AIRIA Workshop on Artificial Intelligence applied to Retinal and Medical Image Analysis, Perth, Australia.
Technical reviewer for various technical journals incl. IEEE T. PAMI, IEEE T. MIA, IEEE T. IP, IEEE T.. GRS, NeurIPS, MICCAI, ISBI, CVPR, ICCV; **NIH Biomedical Imaging** Technology Study Section member.
Member IEEE Senior Member, MICCAI.

TEACHING

2017-present: designed and taught class on deep Learning https://ep.jhu.edu/programs-and-courses/525.733-deep-vision
2013-2016: real time machine vision

FOREIGN LANGUAGES

Fluent in French and Italian, some notions of Spanish and German.