

Christopher Edmund Coletta

CONTACT INFORMATION	Image Informatics and Computational Biology Unit Laboratory of Genetics and Genomics National Institute on Aging National Institutes of Health 251 Bayview Blvd., 10C222, Baltimore, Maryland 21224, USA	office: +1 410-558-8170 mobile: +1 617-943-9745 e-mail: christopher.coletta@nih.gov chriscoletta.com github.com/colettace
RESEARCH INTERESTS	Machine learning, computer vision, data visualization, databases, bioinformatics, morphological markers of aging, automated diagnosis of disease, telemedicine.	
EDUCATION	University of Massachusetts , Amherst, Massachusetts <i>Bachelor of Science, Mechanical Engineering</i> Brother, Pi Tau Sigma Honorary Mechanical Engineering Society. Degree conferred 2007. The Boston Latin School , Boston, Massachusetts 2001 AP Scholar with Honors. Awarded John & Abigail Adams Scholarship. Graduated 2001.	
PROFESSIONAL EXPERIENCE	National Institutes of Health , Baltimore, Maryland <i>Computer Scientist</i>	September 2009 – present Design and conduct computational biology experiments. Lead developer/maintainer of WND-CHARM , an open source computer vision and machine learning toolkit. Research topics include: quantitative morphological assays of biomedical images; Correlation of morphological markers with clinical traits; aid for diagnosis of disease and disease progression; age-related degeneration of muscle tissue. FAES@NIH: Foundation for Advanced Education in the Sciences , Bethesda, MD <i>Lead Instructor</i> Spring 2013, Spring 2014 <i>BIOF 309: Introduction to Python</i> in the Bioinformatics department for Spring 2013 (20 students) and Spring 2014 (40 students). Developed all course materials largely from scratch, including curriculum, reference IPython notebooks, homeworks, and automated homework grading programs using the unittest framework. Course website at chriscoletta.com/biof309 Piers Park Sailing Center, Inc. , Boston, Massachusetts <i>Web Developer/Database Architect</i> October 2008 – May 2009 Architected and implemented a small business MySQL database integrated with the company's Drupal 6 website. Implemented a MediaWiki to facilitate the documentation of business processes. FreeCause, Inc. , Boston, Massachusetts <i>Web Development Intern</i> October 2008 – January 2009 Wrote prototype "PinYourself" Facebook/GoogleMaps webapp that enabled members of a university alumni association or other organization to pin their location on a map and leave messages for other members to read. Developed on LAMP-based proprietary CMS, using JSON, JavaScript, GoogleMaps API. VISTAGY, Inc. , Waltham, Massachusetts <i>Product Developer</i> February 2006 – September 2008 Developed add-on applications for commercial CAD systems CATIA v5, and Unigraphics NX. Co-principal developer for the <i>Quality Planning Environment</i> application. Was responsible for all aspects of implementation from gathering customer requirements, to design, development, testing and release maintenance. This system is currently used in production at Boeing, Goodrich Landing Gear, and other aerospace manufacturing facilities.

Mammalian Morphology and Evolution Laboratory, UMass Amherst Biology Dept.

Research Assistant

January 2005 – July 2006

Wrote *BoneLoad* program as plugin to the Strand7 finite element analysis (FEA) package, coded in Visual Basic .NET 2005. It allows biologists to specify anatomically correct muscle loads on 3D-modeled skeletal structures for FEA stress simulations, calculates both "squeezing" and tangential forces acting on the bone surface when muscle is wrapped over complex bone geometry. Comparison of bone stresses in modern and fossilized bat skulls resulted in insights into evolutionary pressures for optimizing skeletal structure for strength and weight. This work was published in a paper (see below).

University of Massachusetts, Amherst, MA

Teacher's Assistant

MIE 124: Computer Programming for Engineers (Visual Basic 6.0)

Spring 2005, Spring 2003

MIE 230: Thermodynamics

Spring 2005

MATH 127: Calculus I for Life and Social Sciences

Fall 2003, Fall 2004

SELECTED
PUBLICATIONS

Ashinsky BG, Coletta CE, Bouhrara M, Lukas VA, Boyle JM, Reiter DA, Neu CP, Goldberg IG, Spencer RG. Machine learning classification of OARSI-scored human articular cartilage using magnetic resonance imaging. *Osteoarthritis Cartilage*. 2015 Oct;23(10):1704-12.

Tomás Pereira I, Coletta CE, Perez EV, Kim DH, Gallagher M, Goldberg IG, Rapp PR. CREB-binding protein levels in the rat hippocampus fail to predict chronological or cognitive aging. *Neurobiol Aging*. 2013 Mar;34(3):832-44.

Eckley DM, Rahimi S, Mantilla S, Orlov NV, Coletta CE, Wilson MA, Iser WB, Delaney JD, Zhang Y, Wood W 3rd, Becker KG, Wolkow CA, Goldberg IG. Molecular characterization of the transition to mid-life in *Caenorhabditis elegans*. *Age (Dordr)*. 2013 Jun;35(3):689-703.

Orlov NV, Weeraratna AT, Hewitt SM, Coletta CE, Delaney JD, Mark Eckley D, Shamir L, Goldberg IG. Automatic detection of melanoma progression by histological analysis of secondary sites. *Cytometry A*. 2012 May;81(5):364-73.

Grosse IR, Dumont ER, Coletta C, Tolleson A. Techniques for modeling muscle-induced forces in finite element models of skeletal structures. *Anat Rec (Hoboken)*. 2007 Sep;290(9):1069-88.

PROGRAMMING

Python (including data science libraries NumPy, SciPy, matplotlib, Scikit-Learn, Pandas, Jupyter), C++, Git, Bash shell scripting, Unix system administration, Markdown, reveal.js, Amazon AWS, regular expressions, code profiling, vim, tmux, Perl, ImageMagick, ImageJ/Fiji, MySQL, PHP, WordPress, JavaScript, L^AT_EX 2_ε, Oracle VirtualBox

REFERENCES

Dr. Ilya G. Goldberg

Head, Image Informatics and Computational Biology Unit

National Institute on Aging/National Institutes of Health

Baltimore, Maryland, USA

Dr. Ben Busby

Department Chair, Bioinformatics and Computational Biology

Foundation for Advanced Education in the Sciences

Bethesda, Maryland, USA

Jim Koenig

Principal Software Engineer

Siemens PLM Software

Waltham, Massachusetts, USA

Dr. Ian R. Grosse

Professor, Department of Mechanical & Industrial Engineering

University of Massachusetts Amherst