# Colin Kern

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## **Research Interests**

Bioinformatics, epigenetics/epigenomics, machine learning, statistical modeling, data mining.

#### **Education**

## University of California, Davis

Postdoctoral Scholar, Animal Science

June 2015 - Present

Research Areas: Bioinformatics, epigenomics, next-generation sequencing analysis

Advisor: Dr. Huaijun Zhou, hzhou@ucdavis.edu

#### **University of Delaware**

Doctor of Philosophy, Computer and Information Sciences, GPA: 3.77

August 2008 - May 2015

Research Areas: Bioinformatics, machine learning, statistical modeling

Thesis Title: Exploring Long-Range Features in Biosequences for Structure and Interaction Prediction

Advisor: Dr. Li Liao, liliao@udel.edu

## **University of Delaware**

Master of Science, Computer and Information Sciences, August 2006 - August 2008

#### Earlham College

Bachelor of Arts, Computer Science August 2002 - May 2006

#### **Publications**

Kern, Colin and Li Liao. "Lattice models with asymmetric propensity matrices for locationally informed protein structure prediction." *Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine*, 2013.

Kern, Colin, Alvaro J. Gonzalez, Li Liao and K. Vijay-Shanker. "Predicting interacting residues using long-distance information and novel decoding in hidden Markov models." *IEEE Transactions on NanoBioscience* (2013): vol 12. pp. 158-164.

Kern, Colin, Alvaro J. Gonzalez, Li Liao and K. Vijay-Shanker. "Improving interacting residue prediction using long-distance information in hidden Markov models." *Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine*, 2012.

Kern, Colin, Li Liao, and K. Vijay-Shanker. "Improving transmembrane protein prediction by increasing the utilization of local information." *Third International Conference on Bioinformatics and Computational Biology* (BICoB-2011): 1-6.

Green, Richard E., et al. "Three crocodilian genomes reveal ancestral patterns of evolution among archosaurs." *Science* 12 December 2014: 346 (6215).

Platt, Roy N., et al. "Large numbers of novel miRNAs originate from DNA transposons and are coincident with a large species radiation in bats." *Molecular biology and evolution* (2014) 31 (6): 1536-1545.

McCarthy, Fiona, et al. "Crocodylian Genomics: Unraveling Evolution, Development and Traditional Medicine." *Plant and Animal Genome XXII (2014)*.

#### **Work Experience**

University of California, Davis

Postdoctoral Scholar, June 2015 - Present

- Developed software pipelines for analysis of next-generation sequencing data.
- Assisted others in the lab with data analysis and taught the use of bioinformatics tools.
- Mentored an undergraduate student.

## University of Delaware

Research Assistant, September 2011 - Present

- Used Augustus genome annotation tool to predict gene products for three novel crocodilian genomes.
- Created a pipeline for performing reciprocal BLAST to assign orthologs between species and to determine biological pathway completeness.
- Created a database and and website with the biological pathway completeness of 50 archosaur species (<a href="http://birdbase.arizona.edu/reactome/pathways.php">http://birdbase.arizona.edu/reactome/pathways.php</a>)
- Assisted with the collection of tissue samples from chickens for RNA-Seq processing.
- Gathered data on blood from chickens using i-STAT device.
- Worked collaboratively with biologists and bioinformaticians

### Christiana Care Health Systems

Research Assistant, September 2009 - August 2011

- Developed programs to extract quantitative and qualitative information from doctor's notes.
- Worked with large databases of patient information.
- Combined data from multiple sources while taking into account redundancy.

### University of Delaware

Research Assistant, July 2009 - July 2010

• Developed a prediction algorithm for vehicle use to be used in electric car charging planning.

- Created a touchscreen interface for use inside the vehicle to control charging.
- Project funded by the Department of Energy

# University of Delaware

Teaching Assistant, August 2006 - June 2008

- Ran lab sessions for computer science courses teaching computer use (Microsoft Office) and computer programming (C++).
- Graded assignments.
- Held office hours to meet with and help students.
- Worked with professors to identify areas of difficulty for students.