

JONATHAN ARI GOLER

1619 JOSEPHINE ST APT C BERKELEY CA 94703 510.384.6979
JAGOLER@MIT.EDU

EXPERIENCE

PhD Research: Design and Synthesis of mRNA based sensing and actuation devices. Increasingly complex synthetic biological systems require sensing and feedback control elements to optimize performance and to enable new behaviors in synthetic systems. This work developed sensor elements via *in-vitro* selection at physiological Magnesium concentrations, and integrated them into actuation elements.

Specified, Designed and currently developing BioJADE (Biological - Java Analysis and Design Environment) and the BioBricks Repository. BioJADE is a SPICE-like tool that combines design, analysis and simulation tools in an integrated package. BioJADE builds on the foundation of BioBricks: a specification for building complicated synthetic biological regulatory networks out of libraries of simple brick. The system permits users to lay out biological 'circuits', then optimize and simulate them. Simple bricks are drawn from the repository - a data model implemented in Oracle with Apache, Perl and BioPerl. BioJADE itself is implemented in Java, which employs both XML and SQL to achieve its flexibility and connectivity. The simulation architecture is implemented to support parallelism and distributed computation via a custom XML Messaging protocol. This work comprises my Master's Thesis work and is supervised by Senior Research Scientist Thomas F. Knight Jr., for the MIT Synthetic Biology Group at the AI Lab.

Specified, designed, developed and documented the MIT/Caltech Voting Technology Project demonstration voting system. We achieved improved hack-resistance and failure resistance by developing a very parallel system of independently written and executed modules. I wrote the system primarily in Java, backed with a SQL data model and XML DTDs. In addition, I employed AES encryption, and RSA blind signatures to ensure privacy and security. I also demonstrated and explained the system at several conferences including WOTE '01, Georgia Tech Voting Technology Workshops and a briefing for members of the British Parliament. (Reference: Professor Ted Selker)

EDUCATION

University of California Berkeley and San Francisco

PhD in Biological Engineering. keasling lab/joint bioenergy institute

Massachusetts Institute of Technology

M.Eng. in Electrical Engineering and Computer Science expected 6/2004, GPA 5.0/5.0.

S.B. in Electrical Engineering and Computer Science completed 6/2003, GPA 4.5/5.0.

Foci: Synthetic Biology, Computational Biology, Artificial Intelligence, and Economics.

Selected Coursework: Computational Molecular Biology, Biomedical materials, Cryptography, Algorithms, AI, Information and Entropy, Biophysical chemistry, Human Intelligence Enterprise. Undergraduate Research: Professors Ted Selker and Judith Donath at MIT Media Lab, Professor Seth Lloyd in Mechanical Engineering, and Professor Donald Sadoway in Materials Science.

Skills: Java (expert), SQL, C/C++, Scheme, Pascal, Oracle, Linux, Perl, TCL, Basic.

Biological: Sequence Design/Analysis, protein preparation, column and gel chromatography

PUBLICATIONS

Goler, JA, Carothers JM, Keasling JD. Magnesium dependence in Aptamer Selections (In Preparation)

Goler JA, Carothers JM, Keasling JD. Aptazyme-based feedback regulation in metabolic networks (In Preparation)

Goler, JA, Bramlett BW, Peccoud J. Genetic design: rising above the sequence. Trends in Biotechnology. October 2008.

Goler, JA, Knight TF. BioJADE. Systems Bioinformatics: An Engineering Case-Based Approach Alterovitz and Marconi eds. 2006

Selker, T and Goler, J. The SAVE system - secure architecture for voting electronically. BT Technology Journal 22.4 10/2004