Report on the 2011 Critical Assessment of Function Annotation (CAFA) meeting

Summary

The Critical Assessment of Function Annotation meeting was held July 14-15, 2011 at the Austria Conference Center in Vienna, Austria. There were 73 registered delegates at the meeting.

We thank the DOE for this award. It helped us organize and support a scientific meeting AFP 2011 as a special interest group (SIG) meeting associated with the ISMB 2011 conference. The conference was held in Vienna, Austria, in July 2011. The AFP SIG was held on July 15-16, 2011 (immediately preceding the conference).

The meeting consisted of two components, the first being a series of talks (invited and contributed) and discussion sections dedicated to protein function research, with an emphasis on the theory and practice of computational methods utilized in functional annotation. The second component provided a large-scale assessment of computational methods through participation in the Critical Assessment of Functional Annotation (CAFA).

The meeting was exciting and, based on feedback, quite successful. There were 73 registered participants. The schedule was only slightly different from the one proposed, due to two cancellations. Dr. Olga Troyanskaya has canceled and we invited Dr. David Jones instead. Similarly, instead of Dr. Richard Roberts, Dr. Simon Kasif gave a closing keynote. The remaining invited speakers were Janet Thornton (EBI) and Amos Bairoch (University of Geneva).

Use of funds

$4,000 were used towards funding student travel fellowships to the meeting. The fellowship recipients were all presenters of talks or posters at the meeting. All have acknowledged DOE/BER funding in their presentations. The procedure for deciding upon award distribution was as follows: first, the recipient would have had an accepted presentation at the meeting. A request for funds was made by eligible persons using a standard form (attached). The organizers, Predrag Radivojac and Iddo Friedberg ruled on who receives awards. The following criteria were taken into consideration: 1. quality and merit of work; 2. Availability of other funds (either by the organizers or the requester) 3. minority status.

Recipient	Institute	Status	Presentation type	Presentation title	Award sum	Gender	Minority? (Y/N)
Meghana Chitale	Purdue University	Graduate student	Talk		$1,500	F	N
Nemanja Duric	Temple university	Graduate student	Talk		$1,000	M	N

Recipient	Institute	Status	Presentation type	Presentation title	Award sum	Gender	Minority? (Y/N)
Jeffrey Yunes	UC Berkeley	Graduate student	Talk		$1,000	M	N
Artem Sokolov	Colorado State University	Graduate student	Brief talk & poster		$500	M	N

$50 were used for miscellaneous small office purchases, including vellum-like paper for printing awards.
$600 were used for purchasing gift cards at Amazon.com. Twelve cards were purchased at $50 each, and were awarded to best performers at CAFA. Priority was given to students and trainees.

Publications

1. *Nature Methods*
One article was published January 2013 in the journal *Nature Methods*. [1]. This publication was co-authored by the CAFA organizers, steering committee members, experiment assessors, and the participants in the experiment. There are 101 co-authors in total. The article details the experiment's process, results, and identifies the top-scoring algorithms and the groups who wrote them. While all methods are reviewed in some detail, we took care to rank and identify only the top-scoring methods. This minimizes the negative impact on the authors of the other methods. In turn, this helps ensure that CAFA is inclusive, since lower rankings are not specifically disclosed and therefore do not negatively impact participants. According to Google Scholar, this paper was cited 124 times so far. The article acknowledges funding from DOE/BER grant DE-SC0006807TDD.

2. *BMC Bioinformatics*
Fifteen publications resulting from CAFA were published in a special supplement of *BMC Bioinformatics* [2]. The papers in this supplement were written by CAFA participants, include mainly descriptions of methods that were used in CAFA, and one article presenting a critique of CAFA.

3. *PloS Computational Biology*
We have a manuscript accepted in *PLoS Computational Biology* describing the organization of a computational community challenge: "10 Simple Rules for Organizing a Community Computational Challenge". The article will acknowledge funding from DOE/BER grant DE-SC0006807TDD.

Follow Up
We have conducted the second CAFA round, CAFA2 recently, over the period 9/2013-7/2014. The initial analysis was presented the at the ISMB 2014 conference in Boston. The participation in CAFA grew from 29 teams in CAFA1 to 54 in CAFA2. We have also seen significant improvement in mthod performance between CAFA1 and CAFA2, which leads us to believe that the main goal of CAFA, community-based improvement of computational methods is indeed being achieved.

References

1. Radivojac P, Clark WT, Oron TR, Schnoes AM, Wittkop T, Sokolov A, Graim K, Funk C, Verspoor K, Ben-Hur A, Pandey G, Yunes JM, Talwalkar AS, Repo S, Souza ML, Piovesan D, Casadio R, Wang Z, Cheng J, Fang H, Gough J, Koskinen P, Törönen P, Nokso-Koivisto J, Holm L, Cozzetto D, Buchan DW, Bryson K, Jones DT, Limaye B, Inamdar H, Datta A, Manjari SK, Joshi R, Chitale M, Kihara D, Lisewski AM, Erdin S, Venner E, Lichtarge O, Rentzsch R, Yang H, Romero AE, Bhat P, Paccanaro A, Hamp T, Kaßner R, Seemayer S, Vicedo E, Schaefer C, Achten D, Auer F, Boehm A, Braun T, Hecht M, Heron M, Hönigschmid P, Hopf TA, Kaufmann S, Kiening M, Krompass D, Landerer C, Mahlich Y, Roos M, Björne J, Salakoski T, Wong A, Shatkay H, Gatzmann F, Sommer I, Wass MN, Sternberg MJ, Skunca N, Supek F, Bo?njak M, Panov P, D?eroski S, Smuc T, Kourmpetis YA, van Dijk AD, Braak CJ, Zhou Y, Gong Q, Dong X, Tian W, Falda M, Fontana P, Lavezzo E, Di Camillo B, Toppo S, Lan L, Djuric N, Guo Y, Vucetic S, Bairoch A, Linial M, Babbitt PC, Brenner SE, Orengo C, Rost B, Mooney SD, **Friedberg I.** A large-scale evaluation of computational protein function prediction methods (2013) *Nature Methods* 10, 221–227

2. http://www.biomedcentral.com/bmcbioinformatics/supplements/14/S3