Thesis Corrections

George D. Montañez

January 1, 2014

1 Corrections

Lemma 7 contains an error, since the starting inequality does not hold. The terms do not have the same number of terms, and therefore, the rest of the proof does not follow.

Lemma 8 relies on Lemma 7, and thus does not hold either.

These two lemmata are used to prove Theorem 3, and only Theorem 3. Thus, Theorem 3 should not be considered proven. Theorem 3 states:

Theorem 3. *For $b \geq 0$, The number of target sets providing b or more bits of active information in a set S_2 of all possible target sets is less than or equal to $\frac{|S_2|}{2^b}$. The null search probability of finding such a target set in S_2 is, therefore, less than or equal to 2^{-b}.*

A slightly weaker version of Theorem 3 is proven in [1], for $b \geq 2$ and $n \geq 19$, where $n = \log_2 |S_2|$, which is the size of each function in bits. The theorem statement is reproduced here:

Theorem 1. *For $b \geq 2$ and reasonably sized search spaces (of size $n \geq 19$), the number of functions (target sets) providing b or more bits of active information in a finite set S_2 of all possible fixed-length target functions of size n is less than or equal to $\frac{|S_2|}{2^b}$. The probability of finding any such target set in S_2 under uniform random sampling is, therefore, less than or equal to 2^{-b}.*

References

[1] George D Montanez. Bounding the number of favorable functions in stochastic search. In *Evolutionary Computation (CEC), 2013 IEEE Congress on*, pages 3019–3026. IEEE, 2013.