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2018 IEEE 5th International Conference on Engineering Technologies and Applied Sciences, ICETAS 2018  
28 January 2019, Article number 8629111  
5th IEEE International Conference on Engineering Technologies and Applied Sciences, ICETAS 2018; AIT Conference Center Bangkok; Thailand; 22 November 2018 through 23 November 2018; Category number CFP18N08-ART; Code 144743

## Disparity between Theory & Practice : Beyond the Worst-Case Competitive Analysis (Conference Paper)

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### Abstract

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Online algorithms are used in a variety of situations such as forex trading, cache replacement, and job scheduling etc. In an online problem, the algorithm is presented with a sequence of input in a serial fashion such that the algorithm does not have knowledge about the future inputs. For instance, in case of forex, the online algorithm is presented daily exchange rates. The algorithm does not have knowledge about future exchange rates, and has to make an irreversible conversion decision on each day. Competitive Analysis is the standard tool to analyze the performance of online algorithms. Competitive analysis measures the performance of an online algorithm against a benchmark optimum offline algorithm. Competitive analysis is a worst case measure and is criticized as a pessimistic approach for performance evaluation. The assumptions of online algorithms designed under the competitive analysis paradigm also suffer from the same set of problems as competitive analysis it self. In this work, we contribute towards bridging the gap between theory and practice by considering a set of algorithms for online conversion problems and discuss the disparity between the assumed worst-case competitive ratios and experimentally achieved competitive ratios using real world data. We present modified worst-case input sequences in order to make them comparable to real world data. In addition, we also investigate, how the assumptions made by algorithms differs from real world. Further, we highlight other performance measures for online algorithms with the goal of realistic performance evaluation process. © 2018 IEEE.

### SciVal Topic Prominence

Topic: Algorithms | Costs | advice bits

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### Indexed keywords

Engineering controlled terms: Benchmarking Finance Knowledge management

Engineering uncontrolled terms: Cache replacement Competitive analysis Competitive ratio Off-line algorithm On-line algorithms Performance measure Pessimistic approach Theory and practice

Engineering main heading: Electronic trading

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ISBN: 978-153867966-1  
Source Type: Conference Proceeding  
Original language: English

DOI: 10.1109/ICETAS.2018.8629111  
Document Type: Conference Paper  
Publisher: Institute of Electrical and Electronics Engineers Inc.

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## References (28)

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- 
- 1 Ahmad, I., Iqbal, J.  
A novel time series behavior matching algorithm for online conversion algorithms  
  
(2017) *Cluster Computing*, pp. 1-8.  
<http://www.kluweronline.com/issn/1386-7857>  
doi: 10.1007/s10586-017-1481-4  
  
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- 
- 2 Albers, S., Favrholt, L.M., Giel, O.  
On paging with locality of reference ([Open Access](#))  
  
(2005) *Journal of Computer and System Sciences*, 70 (2), pp. 145-175. Cited 31 times.  
doi: 10.1016/j.jcss.2004.08.002  
  
[View at Publisher](#)
- 
- 3 Becchetti, L.  
Modeling Locality: A Probabilistic Analysis of LRU and FWF  
  
(2004) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 3221, pp. 98-109. Cited 24 times.  
  
[View at Publisher](#)
- 
- 4 Borodin, A., Linial, N., Saks, M.E.  
An Optimal On-Line Algorithm for Metrical Task System  
  
(1992) *Journal of the ACM (JACM)*, 39 (4), pp. 745-763. Cited 166 times.  
doi: 10.1145/146585.146588  
  
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- 
- 5 Chen, G.-H., Kao, M.-Y., Lyuu, Y.-D., Wong, H.-K.  
Optimal buy-and-hold strategies for financial markets with bounded daily returns  
  
(2001) *SIAM Journal on Computing*, 31 (2), pp. 447-459. Cited 24 times.  
<http://epubs.siam.org/loi/smjcat>  
doi: 10.1137/S0097539799358847  
  
[View at Publisher](#)
- 
- 6 Damaschke, P., Ha, P.H., Tsigas, P.  
Online search with time-varying price bounds  
  
(2009) *Algorithmica (New York)*, 55 (4), pp. 619-642. Cited 23 times.  
doi: 10.1007/s00453-007-9156-9  
  
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