September 2022

Gal Oren – List of Publications

1. *Theses & Dissertations:*

    1. Gal Oren, **Distributed Management Algorithms for Heterogeneous Computing Systems and Networks.** Ph.D. Dissertation, Ben-Gurion University of the Negev, 2020.

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    2. Gal Oren, **Optimizations of Management Algorithms for Multi-Level Memory Hierarchy.** M.Sc Thesis, the Open University, 2015.

2. *Journal Papers:*

    1. Matan Rusanovsky, Ofer Beer, Gal Oren, **An End-to-End Computer Vision Methodology for Quantitative Metallography.** *Scientific Reports* 12.1 (2022): 1-27.
    2. Leonid Barenboim, Gal Oren, **Distributed Backup Placement.** *Distributed Computing* (2022): 1- 19.
    3. Shalev, Eyal, Stephen J. Bauer, Michael A. Homel, Tarabay H. Antoun, Eric B. Herbold, Oleg Y. Vorobiev, Harel Levin, Gal Oren, Vladimir Lyakhovsky. **Borehole Breakout Modeling in Arkose and Granite Rocks.** *Geomechanics and Geophysics for Geo-Energy and Geo-Resources* 7, no. 1 (2021): 1-23.
    4. Re'em Harel, Idan Mosseri, Harel Levin, Lee-or Alon, Matan Rusanovsky, Gal Oren, **Source-to- Source Parallelization Compilers for Scientific Shared-Memory Multi-core and Accelerated Multiprocessing: Analysis, Pitfalls, Enhancement and Potential.** *International Journal of Parallel Programming* 48.1 (2020): 1-31.

    ---------- *Past rank* ----------

3. *Submitted preprints:*[1]

Selected List of Peer-Reviewed Selective Computer Science Conferences Submissions with Full Papers indexed Proceedings

1. Re'em Harel, Matan Rusanovsky, Ron Wagner, Harel Levin, Gal Oren. **Scalable SALE Benchmark Framework for Supercomputers.** arXiv preprint arXiv:2209.01983 (2022). SUBMITTED to the 37th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2023).
2. Re'em Harel, Yuval Pinter, Gal Oren. **Learning to Parallelize in a Shared-Memory Environment with Transformers.** arXiv preprint arXiv:2204.12835 (2022). SUBMITTED to the 27th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP 2023).
4. Yehonatan Fridman, Re'em Harel, Danny Hendler, Gal Oren. **The Case for Non-Volatile RAM in Cloud HPCaaS.** arXiv preprint arXiv:2208.02240 (2022). SUBMITTED to the International Workshop on Intelligent and Adaptive Edge-Cloud Operations and Services, In conjunction with the 15th IEEE/ACM Conference on Utility and Cloud Computing (UCC 2022).

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[1] In computer science, the preference is for conference full papers publications. See:

- Moher D, Naudet F, Cristea IA, Miedema F, Ioannidis JP, Goodman SN. "Assessing scientists for hiring, promotion, and tenure." PLoS biology. 2018 Mar 29;16(3):e2004089.
- Vrettas, George, and Mark Sanderson. "Conferences versus journals in computer science." *Journal of the Association for Information Science and Technology* 66.12 (2015): 2674-2684.
- Meyer B, Choppy C, Staunstrup J, van Leeuwen J. "Viewpoint research evaluation for computer science." Communications of the ACM. 2009 Apr 1;52(4):31-4

5. *Conferences Full Papers:*

Selected List of Peer-Reviewed Selective Computer Science Conferences Publications with Full Papers Indexed Proceedings

1. Nadav Schneider, Matan Rusanovsky, Raz Gvishi, Gal Oren. **Determining HEDP Foams' Quality with Multi-View Deep Learning Classification.** arXiv preprint arXiv:2208.07196 (2022). ACCEPTED to the 3rd Workshop on Artificial Intelligence and Machine Learning for Scientific Applications (AMS 2022), the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC 2022).
2. Fridman, Yehonatan, Yaniv Snir, Harel Levin, Danny Hendler, Hagit Attiya, Gal Oren. **Recovery of Distributed Iterative Solvers for Linear Systems Using Non-Volatile RAM.** arXiv preprint arXiv:2204.11584 (2022). ACCEPTED to IEEE/ACM 11th Workshop on Fault Tolerance for HPC at extreme Scale, the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC 2022); ACCEPTED to the Intel extreme Performance Users Group (IXPUG 2022).
3. Yehonatan Fridman, Yaniv Snir, Matan Rusanovsky, Kfir Zvi, Harel Levin, Danny Hendler, Hagit Attiya, Gal Oren, **Assessing the Use Cases of Persistent Memory in High-Performance Scientific Computing.** IEEE/ACM 10th Workshop on Fault Tolerance for HPC at extreme Scale, the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC 2021); the Intel extreme Performance Users Group (IXPUG 2021).
4. Yehonatan Fridman, Matan Rusanovsky, Gal Oren, **ChangeChip: A Reference-Based Unsupervised Change Detection for PCB Defect Detection.** IEEE International Conference on Physical Assurance and Inspection of Electronics (PAINE 2021).
5 Gal Oren, Leonid Barenboim, **Backup Placement in WSNs in the Network Management Distributed Setting.** The First Workshop on Next-Generation Mobile Networking and Computing (NGMobile 2021), the 41st IEEE International Conference on Distributed Computing Systems (ICDCS 2021).
6. Kfir Zvi, Gal Oren, **Optimized Memoryless Fair-Share HPC Resources Scheduling using Transparent Checkpoint-Restart Preemption.** First International Symposium on Checkpointing for Supercomputing (SuperCheck 2021), the National Energy Research Scientific Computing Center (NERSC).
7. Gal Oren, Leonid Barenboim, **Distributed Backup K-Placement and Applications to Virtual Memory in Wireless Networks.** 2nd Workshop on Distributed Algorithms for Low-Functional Robots (WDALFR 2021), the 22nd International Conference on Distributed Computing and Networking (ICDCN 2021).
8. Re'em Harel, Matan Rusanovsky, Yehonatan Fridman, Assaf Shimony, Gal Oren, **Complete CVDL Methodology for Investigating Hydrodynamic Instabilities.** First International Workshop on the Application of Machine Learning Techniques to Computational Fluid Dynamics Simulations and Analysis, 35th International Supercomputing Conference (ISC-HPC, CFDML 2020); 12th Israel Machine Vision Conference (IMVC 2021).
9. Idan Mosseri, Lee-or Alon, Re'em Harel, Gal Oren, **ComPar: Optimized Compiler for Automatic OpenMP Source-to-Source Parallelization using Code Segmentation and Hyperparameters Tuning.** The 16th International Workshop on OpenMP (IWOMP 2020).
10. Matan Rusanovsky, Gal Oren, Sigalit Ifergane, Ofer Beeri, **MLography: An Automated Quantitative Metallography Model for Impurities Anomaly Detection using Novel Data Mining and Deep Learning Approach.** arXiv preprint arXiv:2003.04226, ACCEPTED to SIAM Conference on Mathematical Aspects of Materials Science (MS 2020).
11. Leonid Barenboim, Gal Oren, **Distributed Backup Placement in One Round and its Applications to Maximum Matching Approximation and Self-Stabilization.** The 3rd Symposium on Simplicity in Algorithms (SOSA 2020), co-located with the 31st ACM-SIAM Symposium on Discrete Algorithms (SODA 2020).
12. Leonid Barenboim, Gal Oren, **Fast Distributed Backup Placement in Sparse and Dense Networks.** SIAM Symposium on Algorithmic Principles of Computer Systems (APOCS 2020), colocated with the 31st ACM-SIAM Symposium on Discrete Algorithms (SODA 2020).

13. Re'em Harel, Gal Oren, **GraphiX: A Fast Human-Computer Interaction Symmetric Multiprocessing Parallel Scientific Visualization Tool.** The 15th International Parallel Computing Conference (ParCo 2019).
14. Harel Levin, Gal Oren, Eyal Shalev, Vladimir Lyakhovsky, **Acceleration of Hydro Poro-elastic Damage Simulation in a Shared-Memory Environment.** The 15th International Parallel Computing Conference (ParCo 2019).
15. Idan Mosseri, Matan Rusanovsky, Gal Oren, **TradeMarker - Artificial Intelligence Based Trademarks Similarity Search Engine.** The 21st International Conference on Human-Computer Interaction (HCII 2019).

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16. Gal Oren, Leonid Barenboim, Harel Levin, **Distributed Fault-Tolerant Backup-Placement in Overloaded Wireless Sensor Networks.** The 9th International Conference on Broadband Communications, Networks, and Systems (BROADNETS 2018).
17. Gal Oren, Guy Malamud, **CalCul: A Python-based Workspace for High-Performance Parameters-Survey in Scientific Legacy Codes.** The 14th international Parallel Computing conference (ParCo 2017).
18. Gal Oren, Leonid Barenboim, Harel Levin, **Adaptive Distributed Hierarchical Sensing Algorithm for Reduction of Wireless Sensor Network Cluster-Heads Energy Consumption.** The 13th International Wireless Communications and Mobile Computing Conference (IWCMC 2017).
19. Gal Oren, Leonid Barenboim, Harel Levin, **Load-Balancing Adaptive Clustering Refinement Algorithm for Maximization of Wireless Sensor Network Clusters Lifetime.** The 15th International Conference on Wired/Wireless Internet Communications (WWIC 2017).
20 Gal Oren, Yehuda Ganan, Guy Malamud, **AutOMP - An Automatic OpenMP Parallelization Generator for Variable-Oriented High-Performance Scientific Codes.** The 7th International Supercomputing Conference 2017 (ISUM 2017) - Best paper - International Journal of Combinatorial Optimization Problems and Informatics, vol. 9, no. 1, pp. 46-53, Feb. 2018.
21. Gal Oren, Lior Amar, David Levi-Hevroni, Guy Malamud, **The Looking-Glass System: A Unidirectional System for Secure Data Transfer using an Optic Medium.** The 2nd International Conference on Future Network Systems and Security 2016 (FNSS 2016 - Previously IoT-CT at WiMob).
22. Gal Oren, Leonid Barenboim, Lior Amar, **Memory-Aware Management for Heterogeneous Main Memory Complex using an Optimization of the Aging Paging Algorithm.** 2016 Workshop on High-Performance Computing for Big Data (HPC4BD) in conjunction with the 45th International Conference on Parallel Processing (ICPP 2016).

5. *Patents:*

1. Idan Mosseri, Matan Rusanovsky, Gal Oren, inventors; Israel Atomic Energy Commission, assignee. **Similarity Search Engine for a Digital Visual Object.** United States patent application US 17/282,574. 2021 Nov 4.

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6. *Posters and Extended Abstracts:*

Selected List of Peer-Reviewed Selective Computer Science Conferences Poster Presentations

1. Re'em Harel, Yuval Pinter, Gal Oren. **Learning to Parallelize Source Code via OpenMP with Transformers.** Extended Abstract and Research Poster, ACCEPTED to The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC 2022); Research Poster, the Israel Seminar on Computational Linguistics (ISCOL 2022).
2. Yehonatan Fridman, Yaniv Snir, Harel Levin, Danny Hendler, Hagit Attiya, Gal Oren, **Non- Volatile Exact-State-Reconstruction of Preconditioned Conjugate Gradient in Supercomputers.** Research Poster, Platform for Advanced Scientific Computing (PASC 2022); Research Poster, 37th International

Supercomputing Conference (ISC-HPC 2022).

3. Harel Levin, Gal Oren, I Ian Mizrahi, Emil Malka, Eran Brown, **Initial Evaluation of InfiniBoxD Storage System for Embarrassingly Parallel HPC Applications in Small to Mid-Range Supercomputers.** Research Poster, 35th International Supercomputing Conference Research Posters (ISC-HPC 2020).
4. Idan Mosseri, Lee-or Alon, Re'em Harel, Gal Oren, **ComPar: Optimized Compiler for Automatic OpenMP Source-to-Source Parallelization using Code Segmentation and Hyperparameters Tuning.** Ph.D. Forum Poster, the 35th International Supercomputing Conference (ISC-HPC 2020).

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5. Gal Oren, Leonid Barenboim, **Distributed Backup Placement in WSNs and Planar Graphs.** Ph.D. Forum Poster, the 7th Global Young Scientists Summit (GYSS'19).
6. Idan Mosseri, Re'Em Harel, Harel Levin, Matan Rusanovsky, Gal Oren, **Automatic Parallelization for Shared Memory Scientific Multiprocessing.** Research Poster, the 14th International Workshop on OpenMP 2018 (IWOMP 2018); Research Poster, the 30th International Symposium on Computer Architecture and High Performance Computing (SBAC- PAD2018).
7. Gal Oren, Leonid Barenboim, Harel Levin, **Distributed Fault-Tolerant Backup-Placement in Overloaded Wireless Sensor Networks.** Research Poster and Extended Abstract, the 11th ACM International on Systems and Storage Conference (SYSTOR 2018); Ph D. forum Poster, the 32nd IEEE International Parallel & Distributed Processing Symposium (IPDPS 2018).
8. Gal Oren, Leonid Barenboim, Lior Amar, **Memory-Aware Management for Heterogeneous Main Memory Complex using an Optimization of the Aging Paging Algorithm.** Research Poster and Extended Abstract, the 9th ACM International on Systems and Storage Conference (SYSTOR 2016).

7. *Invited talks:*

1. Gal Oren, **invited talk - The Role of Computer Vision in SOTA Metallography.** Computer Vision for Civil and Infrastructure Engineering Workshop, the International Conference on Computer Vision (CVCIE, ICCV, 2023).

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2. Idan Mosseri, Re'Em Harel, Harel Levin, Matan Rusanovsky, Gal Oren, **Automatic Parallelization for Shared Memory Scientific Multiprocessing.** OpenMPCon Developers Conference (OpenMPCon 2018), the 14th International Workshop on OpenMP 2018 (IWOMP 2018).
3. Idan Mosseri, Matan Rusanovsky, Gal Oren, **TradeMarker - Under the Hood.** Google AI for Social Good Workshop, Bangkok 2018.
4. Gal Oren, Shimon Shmooely, **How Governments can use AI for Public Service Delivery?** United-Nations & Google AI for Social Good Summit, Bangkok 2018.
5. Gal Oren, **TradeMarker - Artificial Intelligence based Trademarks Similarity Search Engine.** Policy Implementation in the Age of Big Data Conference, the Knesset 2018.
6. Gal Oren, Idan Mosseri, Matan Rusanovsky, **TradeMarker - One of Seven leading AI for Social Good Projects of 2018,** AI for Social Good conference, Google Headquarters, California 2018.

נספח א': פרסומים נבחרים שנשענו על NegevHPC באופן ישיר ומוצהר

NegevHPC: A Scientific High-Performance Cloud Service

Gal Oren

Abstract—**NegevHPC is now used by many researchers to perform high-performance scientific computations. These computations are done free of charge, both on hardware and on maintenance, in order to strengthen scientific activity. It is a must for any publication of any kind that presents results that have been computed by NegevHPC, to give recognition to the NegevHPC project within the Acknowledgments paragraph in the following format:**

```
Computational support was provided by the NegevHPC project.
```

LaTeX users should use the following format:

```
\section*{Acknowledgments}
Computational support was provided by the NegevHPC project \cite{negevhpc}.
```

All researchers should use the following format in the references chaper of thier publication:

```
@misc{negevhpc,
  title = {{NegevHPC Project}}, howpublished = "\url{www.negevhpc.com}", note = "[Online]"
}
```

The following references are in accordance with those guidelines [?].

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[1] Jesus Barrio, Shmuel Barzilai, Neeta Karjule, Pilar Amo-Ochoa, Felix Zamora, and Menny Shalom. Fluorescent carbon nitride macrostructures derived from triazine-based cocrystals. *Advanced Optical Materials*, 9(19):2100683, 2021.

[2] Jesus Barrio, Shmuel Barzilai, Neeta Karjule, Pilar Amo-Ochoa, Felix Zamora, and Menny Shalom. Synergistic doping and surface decoration of carbon nitride macrostructures by single crystal design. *ACS applied energy materials*, 4(2): 1868—1875, 2021.

[3] Shmuel Barzilai, Michael Aizenshtein, Moshe H Mintz, and Shmuel Hayun. Effect of adsorbed oxygen on the dissociation of water over gadolinium oxide surfaces'. Density functional theory calculations and experimental results. *The Journal of Physical Chemistry C*, 124(27):14613-14621, 2020.

[4] Guy Cohen. A multiorbital quantum impurity solver for general interactions and hybridizations. *CCQ*, 2019.

[5] Eitan Eidelstein, Shmuel Barzilai, Stefano Curtarolo, and Ohad Levy. First principles investigation of cold curves of metals. *Israel Journal of Chemistry*, 60(8-9):897-904, 2020.

[6] Eitan Eidelstein, Emanuel Gull, and Guy Cohen. Multiorbital quantum impurity solver for general interactions and hybridizations. *Physical Review Letters*, 124(20):206405, 2020.

[7] Moshe Eisenberg, Ore Gottlieb, and Ehud Nakar. Observational signatures of stellar explosions driven by relativistic jets. *arXiv preprint arXiv:2201.08432*, 2022.

[8] Gilead Eliyahu-Caspi, Guy Makov, Salman Rosenwaks, and Boris D Barmashenko. Dissociative recombination of k2+ and rb2+ in diode- pumped alkali lasers: Potential energy curves and atomic products. *The Journal of Physical Chemistry A*, 2022.

[9] Yehonatan Fridman, Re'em Flarel, and Gal Oren. The case for nonvolatile ram in cloud hpcaas. *arXiv preprint arXiv:2208.02240*, 2022.

[10] Yehonatan Fridman, Matan Rusanovsky, and Gal Oren. Changechip: A reference-based unsupervised change detection for pcb defect detection. In *2021 IEEE Physical Assurance and Inspection of Electronics (PAINE)*, pages 1-8. IEEE, 2021.

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IEEE/ACM 11th Workshop on Fault Tolerance for HPC at extreme Scale (FTXS), pages 11-20. IEEE, 2021.

[13] Emir Galilee, Havatzelet Yahel, and Gal Oren. 'our forest-eur home': leisure and tourism among the bedouin minority in southern israel. *Journal of Tourism and Cultural Change*, pages 1-15, 2022.

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[21] Eshed Magali and Chen Dubi. Simulation of noise experiments using a stochastic differential equation model. *Available at SSRN 4142319*, 2022.

[22] Y Mordekovitz, S Sagi, S Barzilai, and S Hayun. Effect of nd content on the energetics of h 2 o adsorption and defect structure in the ce (1- x) nd x o (2- 0.5 x) system. *Journal of Materials Chemistry A*, 8(41):21842—21851, 2020.

[23] Idan Mosseri, Lee-or Alon, Re'Em Harel, and Gal Oren. Compar: optimized multi-compiler for automatic openmp s2s parallelization. In *International Workshop on OpenMP*, pages 247-262. Springer, Cham, 2020.

[24] Daniel Potashnikov, Elad Nisan Caspi, Asaf Pesach, Quanzheng Tao, Johanna Rosen, Denis Sheptyakov, Hayden A Evans, Clemens Ritter, Zaher Salman, Pietro Bonfa, et al. Magnetic structure determination of rare-earth based, high moment, atomic laminates; potential parent materials for 2d magnets. *arXiv preprint arXiv:2105.14555*, 2021.

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[26] Matan Rusanovsky, Ofer Beeri, and Gal Oren. Mlography: An automated quantitative metallography model for impurities anomaly detection using data mining and deep learning.

[27] Matan Rusanovsky, Ofer Beeri, and Gal Oren. An end-to-end computer vision methodology for quantitative metallography. *Scientific Reports*, 12(l):l-27, 2022.

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[30] Nadav Schneider, Matan Rusanovsky, Raz Gvishi, and Gal Oren. Determining hedp foams' quality with multi-view deep learning classification. *arXiv preprint arXiv:2208.07196*, 2022.

[31] Kfir Zvi and Gal Oren. Optimized memoryless fair-share hpc resources scheduling using transparent checkpoint-restart preemption. arXiv preprint arXiv:2102.12953, 2021.

נספח ב': הסבר לעניין הפרסום בכנסים במדעי המחשב מול פרסום בז'ורנלים בשאר התחומים המדעיים.

Choosing a venue: conference or journal?

by Michael Ernst (mernst@cs.washington.edu)
December, 2006

Contents:

(Also see my advice on writing a technical paper, and a letter to USCIS making the point that in computer science, papers in peer-reviewed conferences are accepted as high-quality scholarly articles.)

(Note: This webpage is oriented toward computer scientists. The information is not necessarily accurate for other scientific fields.)

Should you publish your work in a conference or in a journal? Each is appropriate in certain circumstances. This webpage lays out some of the tradeoffs.

This information is accurate to the best of my knowledge, and it agrees with what all top researchers say. However, it is not intended to impugn any particular conference or journal — there are always exceptions to a rule.

Why to prefer a conference

In computer science, your preference should be for conference publication. Here are some reasons.

- Conferences have higher status. In part this is a historical artifact of the field of computer science, but it is self-perpetuating since that makes the best researchers want to send their papers to conferences rather than journals.
- Conferences provide higher visibility and greater impact. Many people will attend your talk, you will have the opportunity to answer questions, and people will talk to both you and to one another in the hallways. Even disregarding the event itself, more non-attendees read conference proceedings than read journals.
- Conferences have higher quality. Acceptance rates to good conferences are often around 10% (at least in software engineering, which is my field), whereas even the best journals are less selective. Naturally, there exist low-quality conferences (and journals), but if your c.v. is cluttered with them, then you will appear to be incapable of good work (even if the work you published in those venues really is good!), and your good publications will not stand out. A good rule of thumb is that the best conferences are sponsored by ACM.
- Conferences are more timely. It can take years for a journal publication to appear (or even for reviews to come back), whereas the turnaround time for conference reviews is a few months, and the proceedings also appear quickly.
- Conferences have higher standards of novelty. Journals often only require 20-30% of the material to be new, compared to an earlier conference version.

Why to prefer a journal

There are situations in which journal publication is desirable.

- Journals may have longer page limits. If you have too many experimental results to fit in a conference publication, then a journal affords an opportunity to include them. You can also include proofs that are too

long (or boring) for a shorter publication. A journal paper could recap or given an overview of an entire research area.

- Journal reviews may be more detailed. Ideally, a journal reviewer will spend days on a paper, whereas a conference reviewer cannot afford to do so for each of the many papers he or she is assigned. Conference reviewers may believe the authors' claims (regarding a proof, for example), whereas journal reviewers are expected to verify them. Especially in certain fields, reviewers may expect that a paper will be submitted (or re-submitted) to a journal. In any event, if you get a longer review, that can help you to improve your work or to understand its shortcomings.
- Journals give the opportunity to revise your work and re-submit it for review. Actually, conferences give this too: if a paper is rejected from one conference, then you can revise based on the reviewers' comments and submit to a different conference, or the same one the next year.
- Journals have higher acceptance rates, giving the opportunity to get your research published. The same is true of workshops. These are particularly good venues for people who are just starting their research careers.
- Some lesser-ranked universities evaluate faculty on the basis of journal publications, because the Dean of Engineering is unable or unwilling to understand computer science. In most scientific fields, journals have higher standards than conferences; computer science is a rare exception. A top-ranked CS department can convince the dean to use the proper evaluation metric. A lower-ranked CS department cannot (the dean may think the department is trying to fool him or her). If you are at one of these universities, you will need to publish in journals, probably by submitting slightly revised versions of your conference papers to journals. The rush for people at lower-ranked universities (some of whom are excellent researchers, and some of whom are not) to submit even marginal results to journals is another regrettable factor that tends to lower the overall quality of journals.

The best papers at a conference are often solicited for expedited journal publication. I sometimes decline these opportunities, but your circumstances may be different. Whether you accept this invitation should be based on the factors above, such as whether there is value to the community of an expanded version of the paper, and how much more work it is to prepare the journal version. (For example, is there a thesis, technical report, or other document with additional material beyond the conference paper? Even better, are there additions that were suggested by reviewers or during discussions at the conference?)

The journal version of a publication will be cited more than the conference version, because the journal version has a later date and thus seems more authoritative. This is a good thing if the journal version adds real value (or corrects problems!). However, if you have cluttered the paper with a lot of details that aren't crucial (like extra tables of results, experiments that support your point slightly less strongly than the main ones, or discussions of tangential issues), then your paper may actually have less impact because readers will get mired in the irrelevant details. Good writing can avoid such problems.