ERRATUM:"On the Automatic Parallelization of Subscripted Subscript Patterns using Array Property Analysis"

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Abstract

This article discusses and corrects minor errors in our work published in the *Proceedings of the ACM International Conference on Supercomputing, 2021*. The changes do not affect the results and major findings of the work.

1 Error and Solution

We discuss the error in [1] and the solution. The error is in Section 4.3 of the text, which discusses the application of the compile-time array analysis algorithm on an example subscripted subscript loop from the Cholesky Factorization benchmark. The loop is presented in Figure 11 in [1]. The corrected version of this loop is shown in Figure 1 below. This further changes the first paragraph of Section 4.3 in the following way – "The subscript expression of array Lx on line 15 is q, where q is $Map[i] + psx + (k - k1) * nsrow$. The outermost k-loop on line 2 can be parallelized, if the maximum value of q in any iteration k is less than its value in the next iteration i.e. $k+1$ so that the values appearing at the subscript of array Lx on line 15 do not overlap across iterations of the loop". No changes are required for the rest of the text in Section 4.3.

The changes do not affect any of the results presented in Section 5 of [1].

1

```
1  #pragma omp parallel for private (p, pf, i, k, q, fjk)
2  for (k = k1 ; k < k2 ; k++)
3  {
4    for (pf = Fp[k]; pf < Fp[k+1]; pf++)
5    {
6      j = Fi[pf] ;
7      fjk[0] = Fx[pf];
8      for (p = Ap[j]; p < Ap [j+1] ; p++)
9      {
10         i = Ai[p];
11         if (i >= k && Map[i] >= 0)
12         {
13           /* Multiplication for REAL input values */
14           q = (Map[i]+psx+(k-k1)*nsrow);
15           Lx[q]  += Ax[p] * fjk[0];
16         }
17       }
18     }
19 }
```

Figure 1: Corrected subscripted subscript loop.

References

[1] Bhosale, A., Eigenmann, R.: On the automatic parallelization of subscripted subscript patterns using array property analysis. In: Proceedings of the ACM International Conference on Supercomputing. p. 392–403. ICS '21, Association for Computing Machinery, New York, NY, USA (2021). https://doi.org/10.1145/3447818.3460424, https://doi.org/10.1145/3447818.3460424