

Memory Access Statistics

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1. Memory Access Statistics

In this section, we show memory statistics for the memory useful-lifetimes as well as for the def-use intervals. Following are graphs of the cumulative data for :

- memory access-use intervals (inter-reference gaps)
- memory useful-lifetimes (def-last-useful-use intervals)
- memory def-use intervals

Both a density and a distribution over the associated intervals is shown. The data is cumulative over all programs and memory variables of each program.

Figures 1 and 2 show the density and distribution respectively for the memory reads over instruction intervals. An access is defined as either a read or a write. So an access-usage interval is the interval in instructions from either a read or a write to the next read of the same variable. There an instance of an access-usage for each memory read in the executed program.

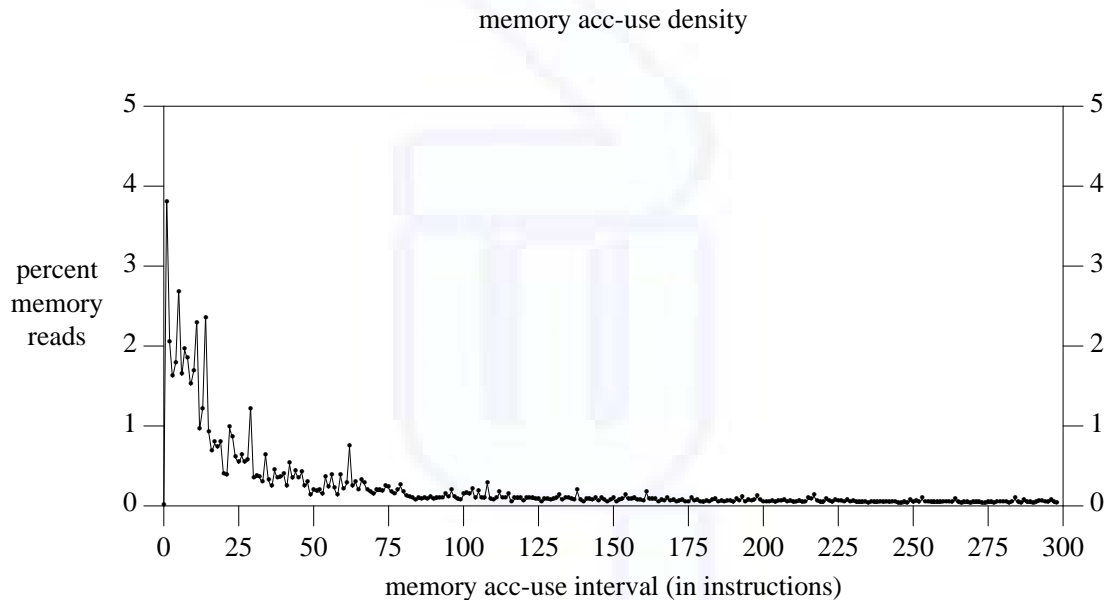


Figure 1. Cumulative Memory Access-Usage Density

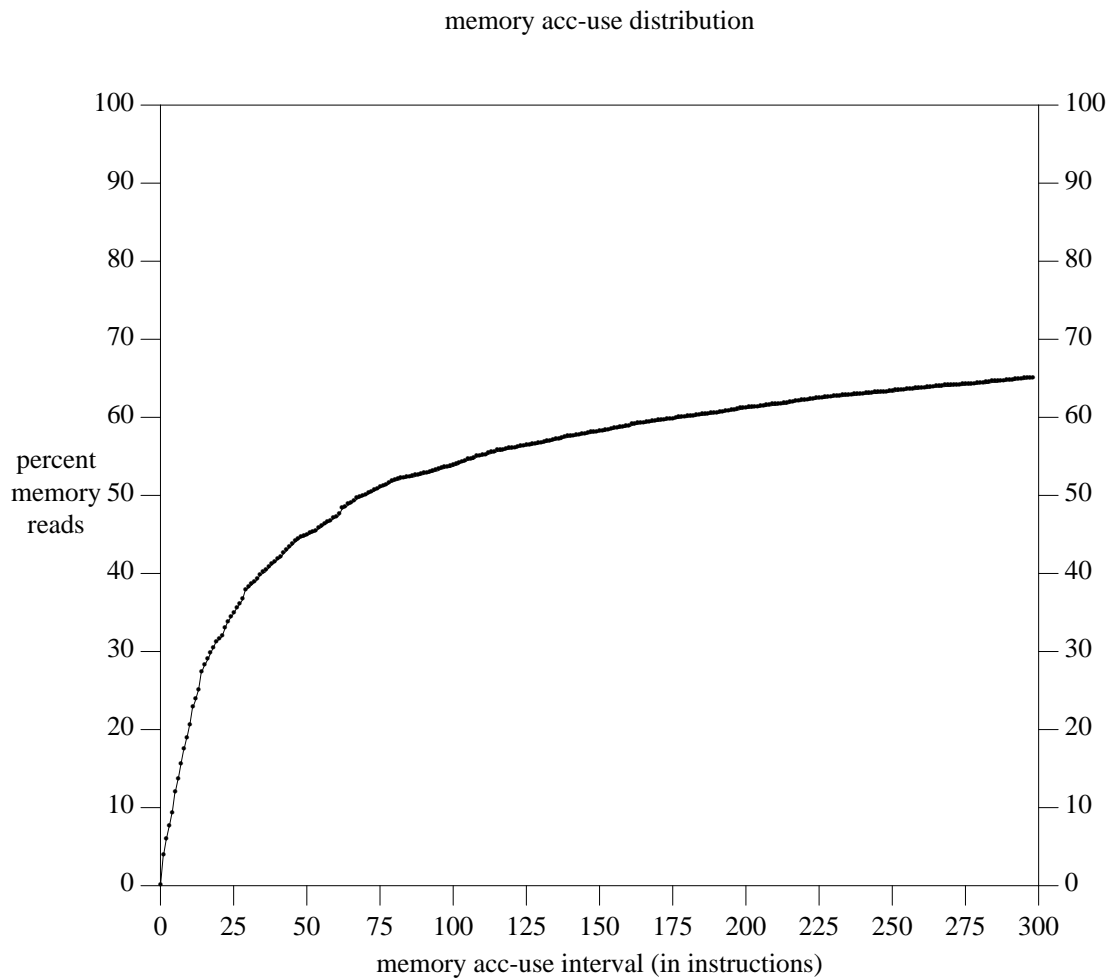


Figure 2. Cumulative Memory Access-Usage Distribution

Figures 3 and 4 show the density and distribution respectively for the memory writes over the useful-lifetime interval as measured in instructions. Our definition of *Useful-lifetime* (which is the same as that by Franklin and Sohi) is the interval in dynamic instructions from a write of a variable to the last useful read of the same variable. There is an instance of a useful-lifetime associated with each write of the executed programs. However, it should be noted that the present data does not include the last write for which the last useful read has not yet been determined. This would seem to be more appropriate than assuming that the last executed read of a variable was indeed the same useful read (since it is unknown whether there are further reads afterwards).

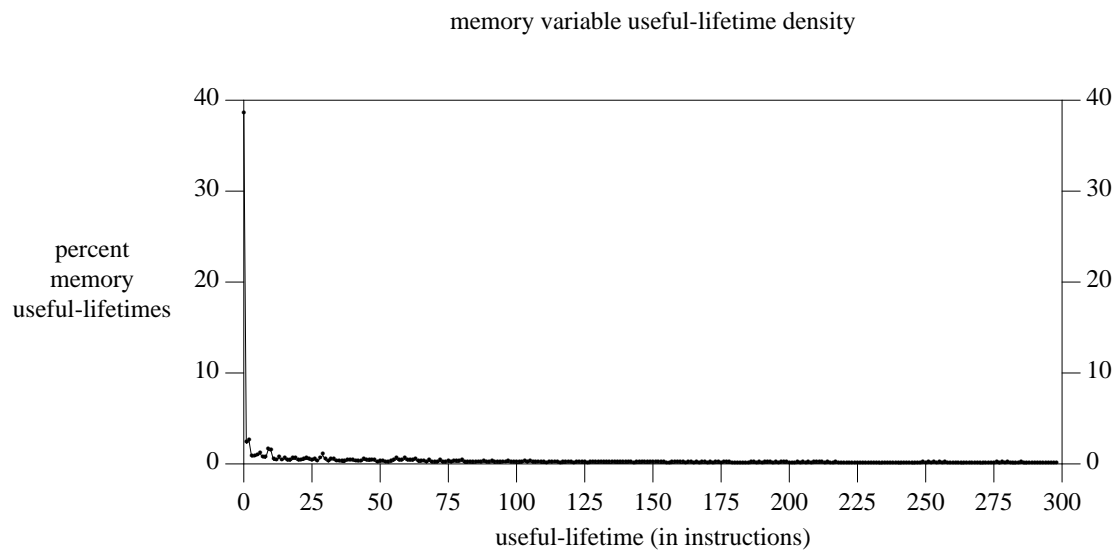


Figure 3. Cumulative Register Useful-Lifetime Density

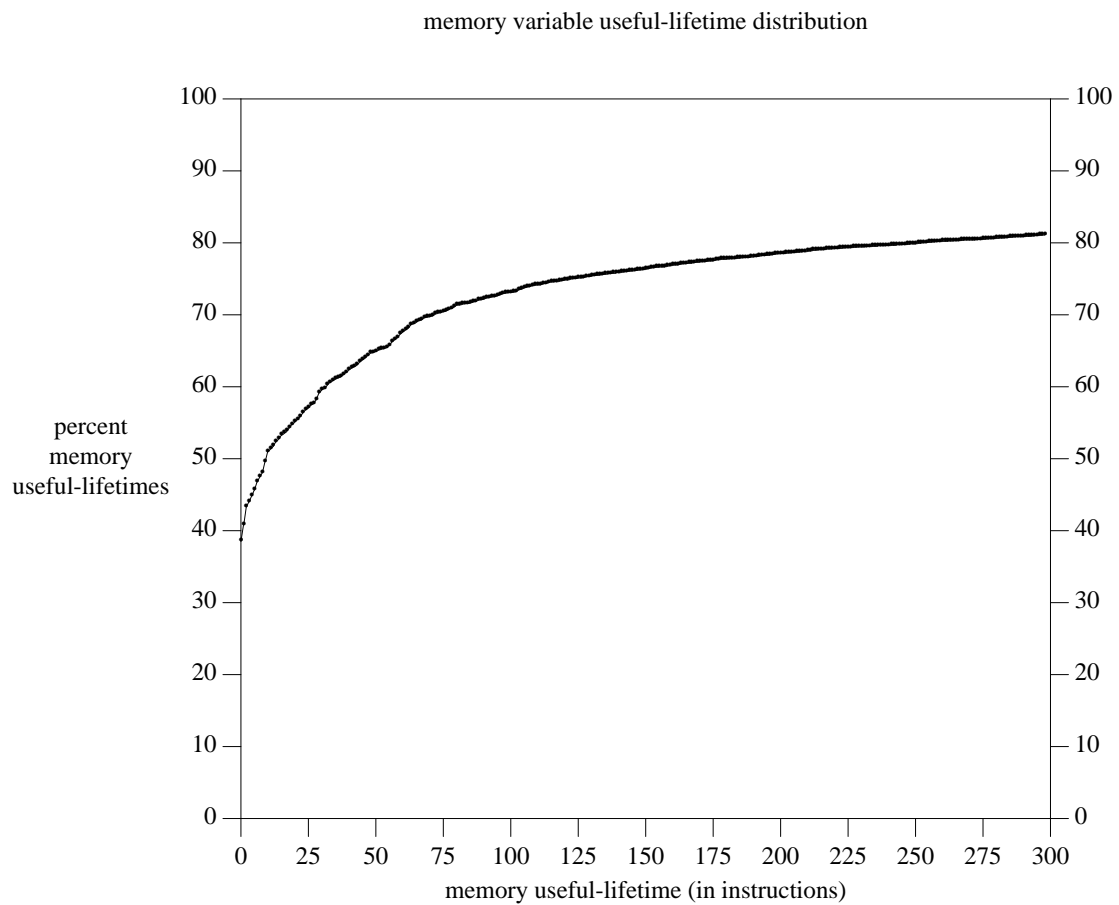


Figure 4. Cumulative Memory Useful-Lifetime Distribution

Figures 5 and 6 show the density and distribution respectively for the memory reads over intervals as measured in instructions.

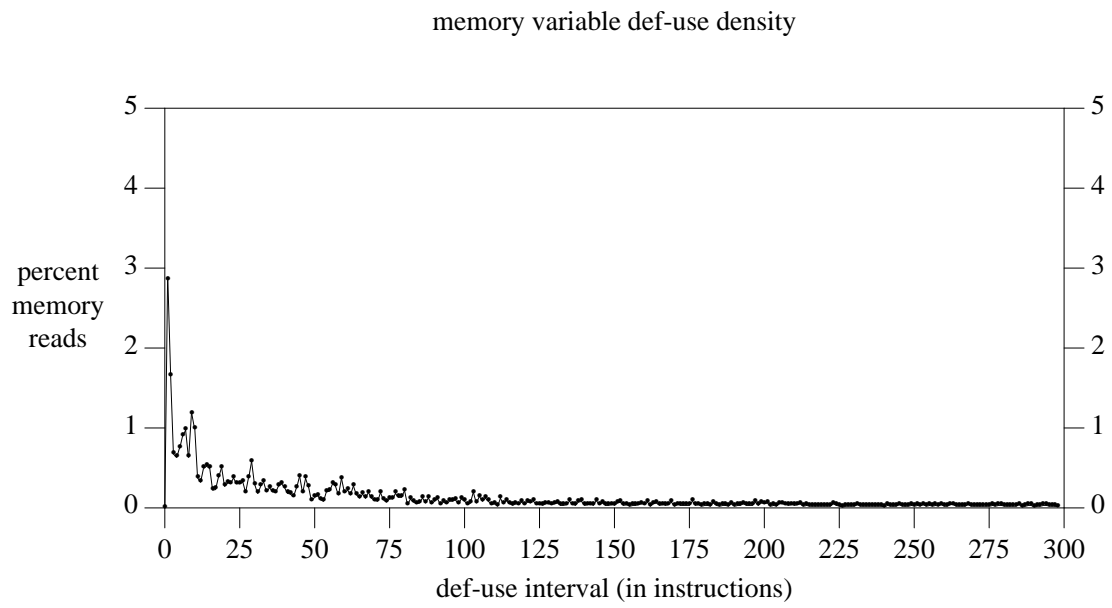


Figure 5. Cumulative Memory Def-Use Density

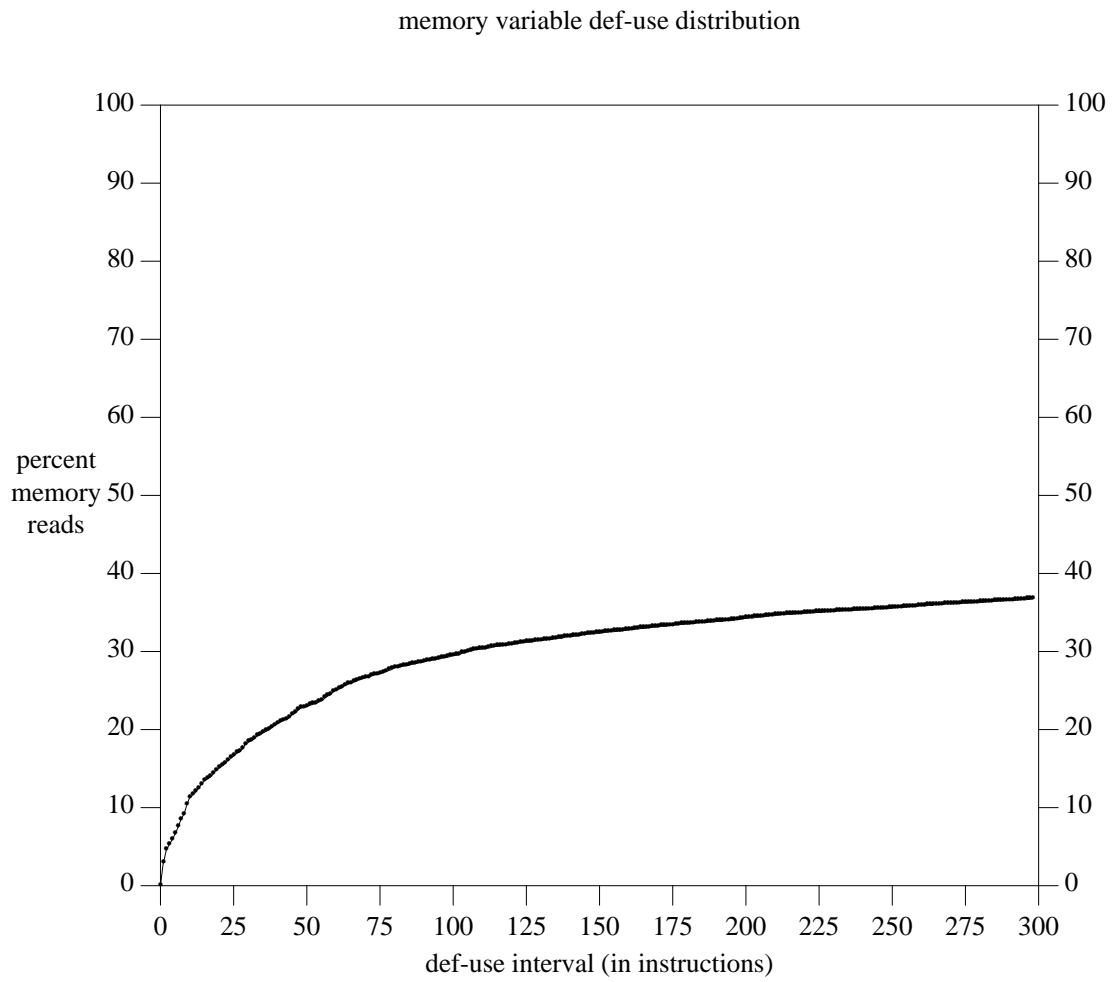


Figure 6. Cumulative Memory Def-Use Distribution