Contest Results
Prefetch Contest: Setup

• Traces:

<table>
<thead>
<tr>
<th>benchmark</th>
<th>length</th>
<th>note</th>
</tr>
</thead>
<tbody>
<tr>
<td>grep</td>
<td>12M</td>
<td>same as web site</td>
</tr>
<tr>
<td>plamap</td>
<td>12.6M</td>
<td>same as web site</td>
</tr>
<tr>
<td>testgen</td>
<td>4.7M</td>
<td>same as web site</td>
</tr>
<tr>
<td>g++</td>
<td>42M</td>
<td></td>
</tr>
<tr>
<td>gzip</td>
<td>49M</td>
<td></td>
</tr>
<tr>
<td>ls</td>
<td>49M</td>
<td></td>
</tr>
<tr>
<td>mcf</td>
<td>50M</td>
<td>tree traversal</td>
</tr>
</tbody>
</table>

• Machine: cseapel08 and TA’s FreeBSD machine
Prefetch Contest

• Grading:
  • writing (2)
  • creativity (3)
  • evaluation (6): Must discuss/analyze the result
  • performance (2)
    • get 1 if achieving speed up
    • get 2 if beats TA’s 4 block sequential prefetcher
Results

Top 3

Hung Wei

Crazy Ideas
And the Winner Is!
Special Award for Creativity I

• Oscar Beijbom & David Curran
• Hedged-based combining prefetcher
  • Combined 7 different prefetchers using machine learning.
• Style points for extra greek in their write up.

Initialize expert discounted gains to 1 and expert weights to $1/n$.

for each iteration do
  Choose one expert randomly from a weighted distribution of experts
  Take this action
  See what happens
  for each expert do
    Get an instantaneous gain, $g_n$, according to some gain function.
    Update discounted gain as $dG_n \Rightarrow dG_n \times \gamma + l_n \times (1 - \gamma)$
    Update weight as $w_n = e^{(-\eta \times dG_n)}$
  end for
  Normalize weights so that $\sum_n w_n = 1$
end for
Special Award for Creativity 2

• Rex Wang
• Hybrid stride/sequential prefetcher
• Critique of the hedge algorithm
Raw Speed

• Third place:
  • Jørgen P. Tjernø -- Per-PC stride-based predictor, and some good analysis.
  • AMAT = 1.34

• Second place:
  • Weng ShihHung
  • Aggressive stream buffer.
  • AMAT = 1.36

• First place:
  • He Liu -- sequential/anti-sequential prefetcher
  • Good analysis of the traces we provided
  • AMAT = 1.38