

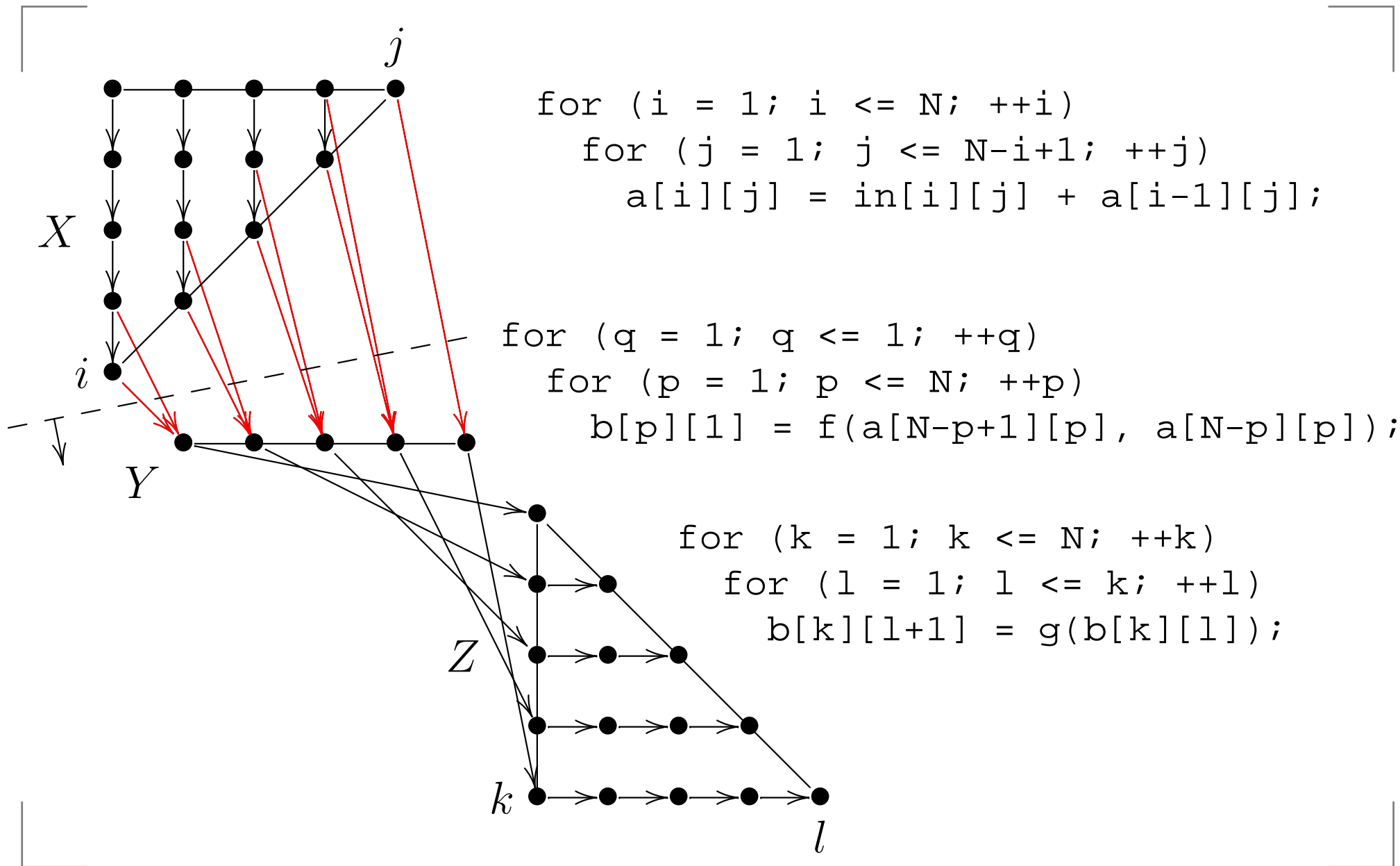
Searching for optimal loop transformations

- Embedded systems + Multi-media
- Optimize power consumption
- Loop transformations ($\mathcal{A}(\vec{i}) = A\vec{i} + \vec{a}$)
- Polyhedral model
- Linear algebra

$$\mathcal{D} = [-A_p \quad A_c] \delta + \vec{a}_c - \vec{a}_p$$

- Search for “optimal” loop transformation
- Using AI search techniques

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```

for (i = 1; i <= N; ++i)
  for (j = 1; j <= N-i+1; ++j)
    a[i][j] = in[i][j] + a[i-1][j];

```

```

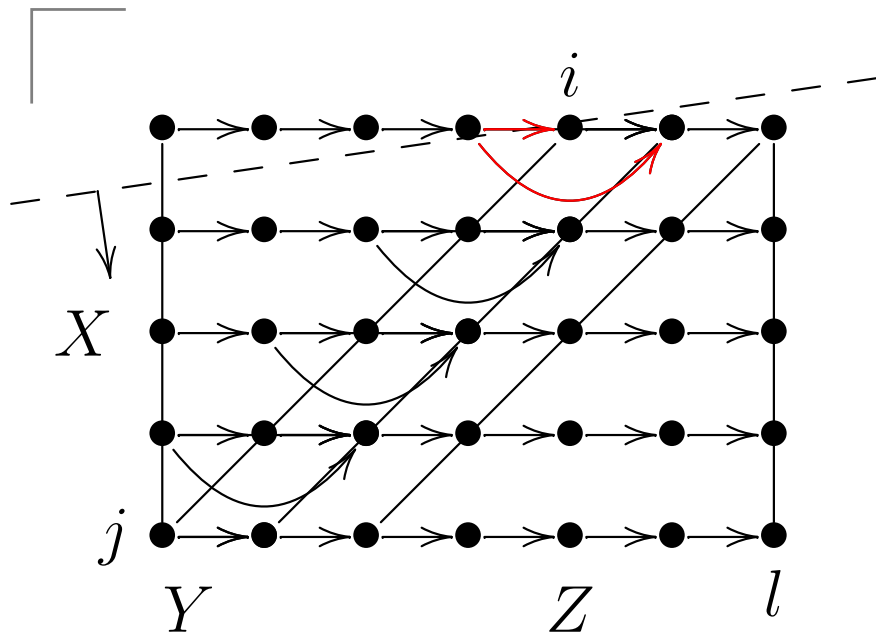
for (q = 1; q <= 1; ++q)
  for (p = 1; p <= N; ++p)
    b[p][1] = f(a[N-p+1][p], a[N-p][p]);

```

```

for (k = 1; k <= N; ++k)
  for (l = 1; l <= k; ++l)
    b[k][l+1] = g(b[k][l]);

```



```

for (j=1; j<=N; ++j) {
  for (i=1; i<=N-j+1; ++i)
    a[i][j] = in[i][j] + a[i-1][j];
  b[j][1] = f(a[N-j+1][j], a[N-j][j]);
  for (l=1; l<=j; ++l)
    b[j][l+1] = g(b[j][l]);
}

```