item input edge
$< i, v_j >$

user input edge
$< i, u_i >$

U

rating edge
$< i < j, r_{i,j} >>$

user output edge
$< i, u_i >$

item output edge
$< j, u_i >$

Dependency Checking

user   item   rating

Dependency Queue for u_i

Task Execution

Computing Task for u_i

$$u_i = u_i - \alpha(\sum (u_i^T v_j - r_{i,j})v_j + \lambda u_i)$$

Data Sending

Send $< i, u_i >$ by user out edge
Send $< j, u_i >$ by item out edge