

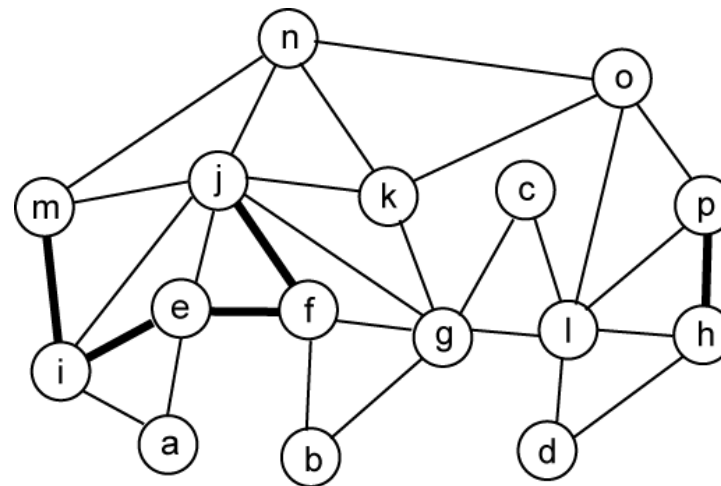
# Mincut Placement

- Perform quadrature mincut onto  $4 \times 4$  grid
  - Start with vertical cut first

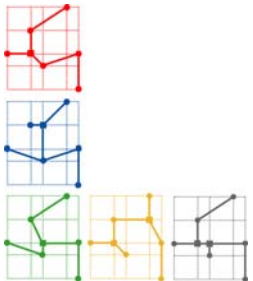
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$$\begin{aligned}
 n_1 &= \{e, f\} \\
 n_2 &= \{a, e, i\} \\
 n_3 &= \{b, f, g\} \\
 n_4 &= \{c, g, l\} \\
 n_5 &= \{d, l, h\} \\
 n_6 &= \{e, i, j\} \\
 n_7 &= \{f, j\} \\
 n_8 &= \{g, j, k\} \\
 n_9 &= \{l, o, p\} \\
 n_{10} &= \{h, p\} \\
 n_{11} &= \{i, m\} \\
 n_{12} &= \{j, m, n\} \\
 n_{13} &= \{k, n, o\}
 \end{aligned}$$


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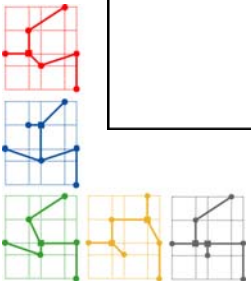
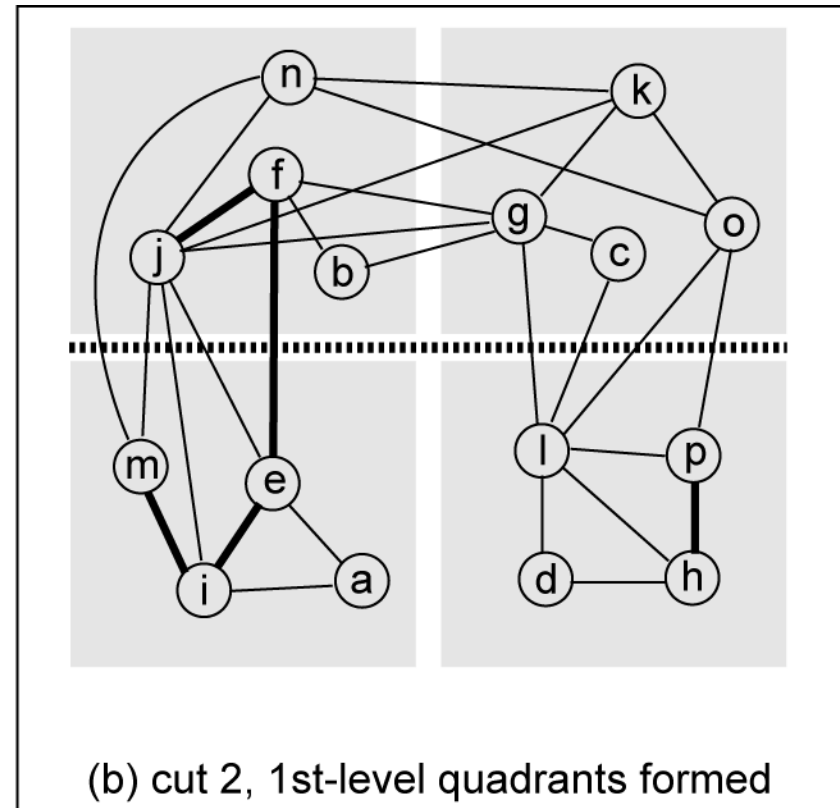
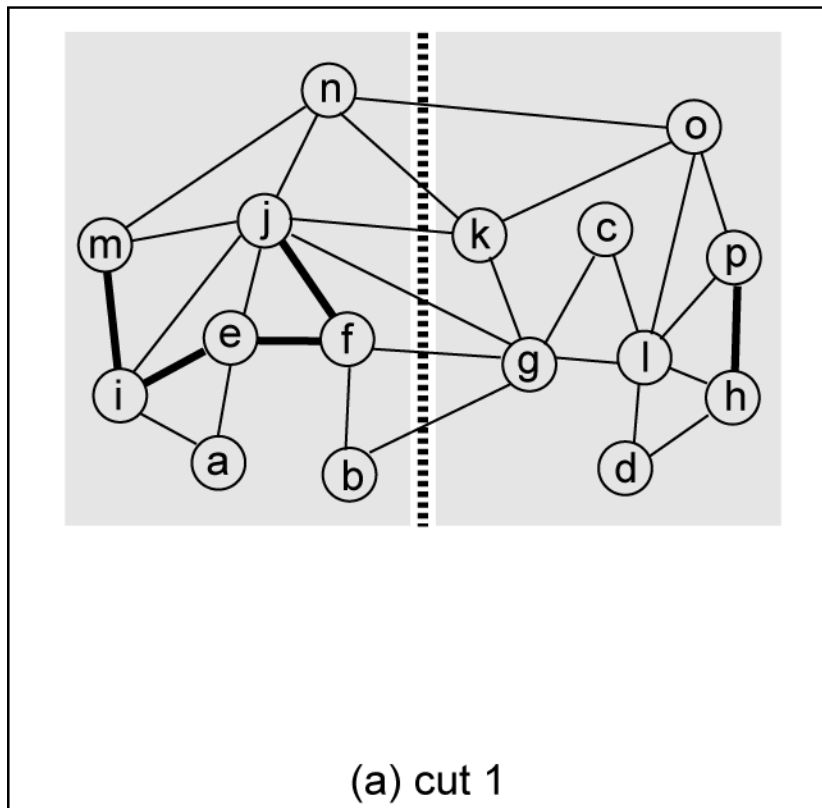


undirected graph model w/ k-clique weighting  
thin edges = weight 0.5, thick edges = weight 1



# Cut 1 and 2

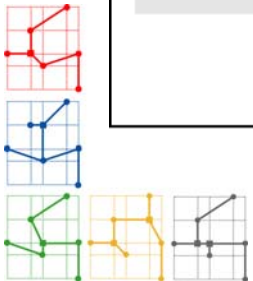
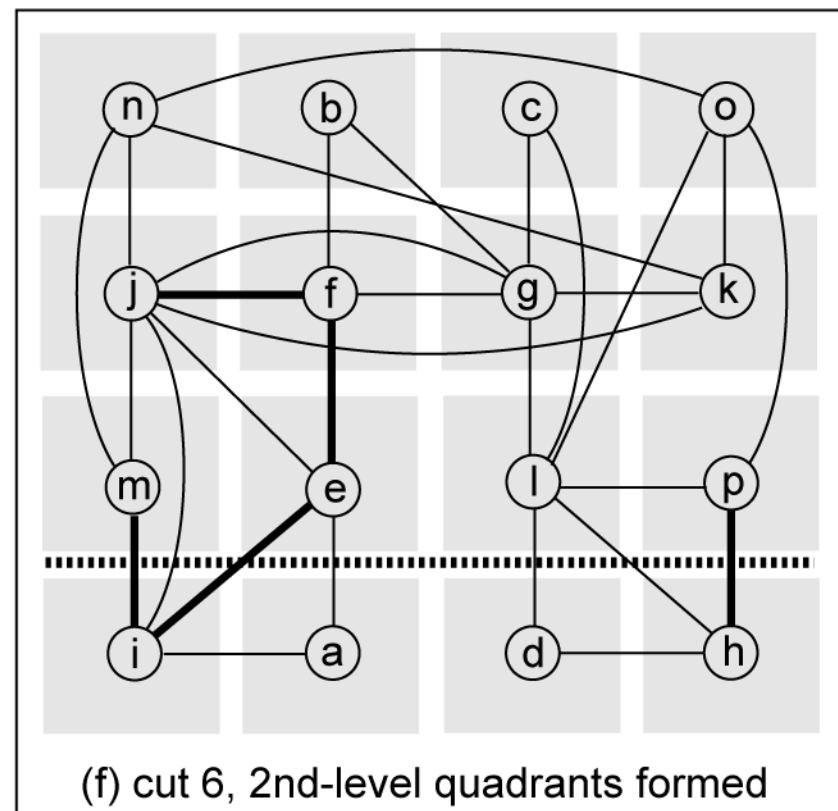
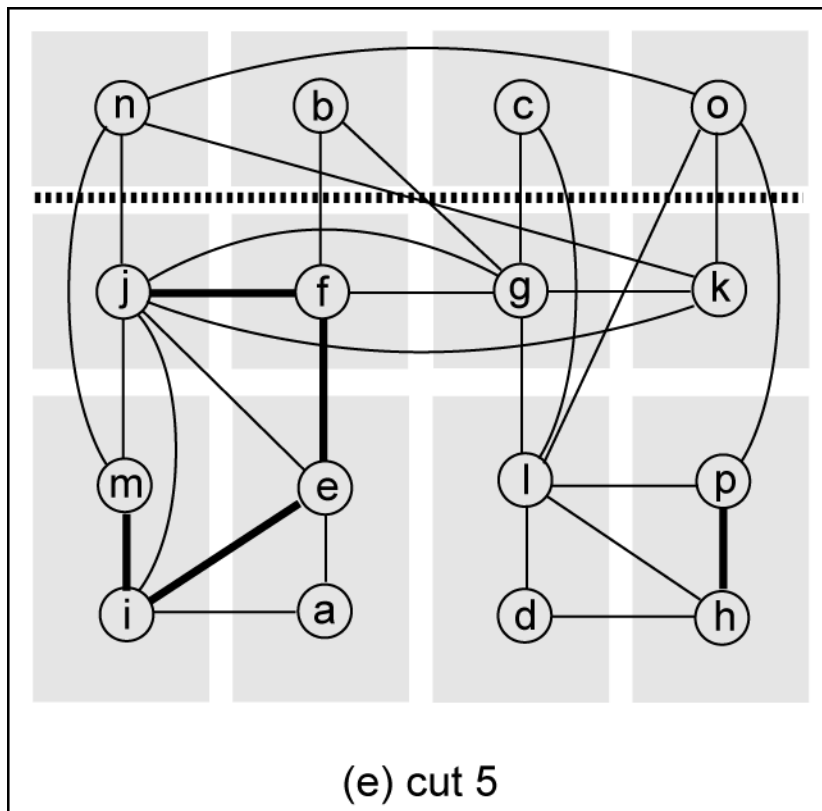
- First cut has min-cutsizes of 3 (not unique)
  - Both cuts 1 and 2 divide the entire chip





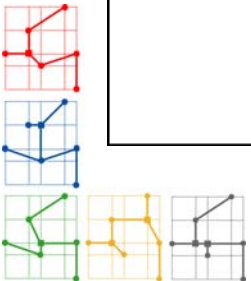
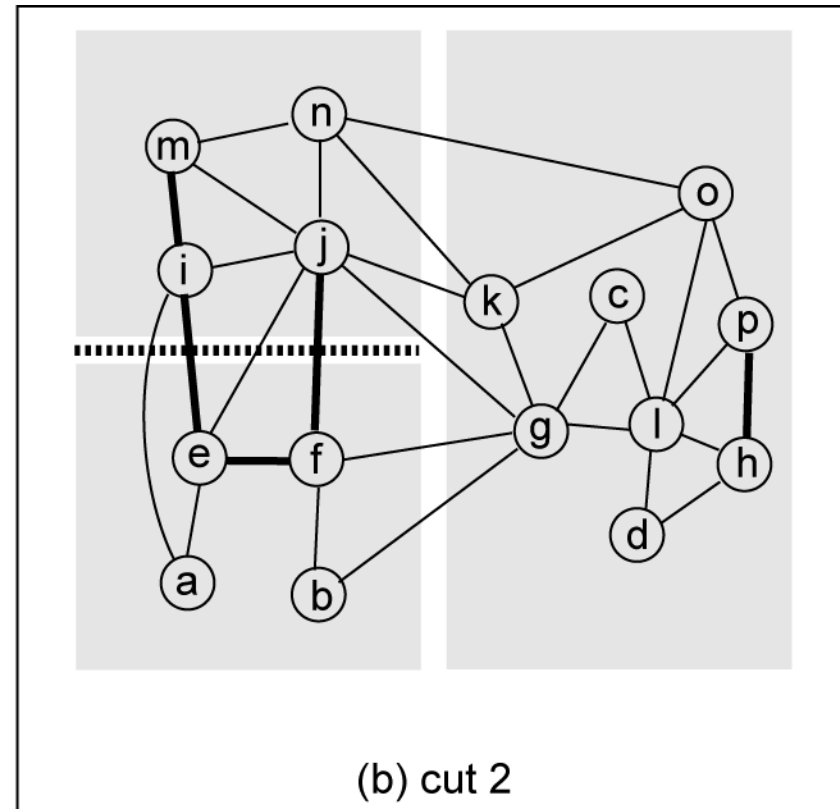
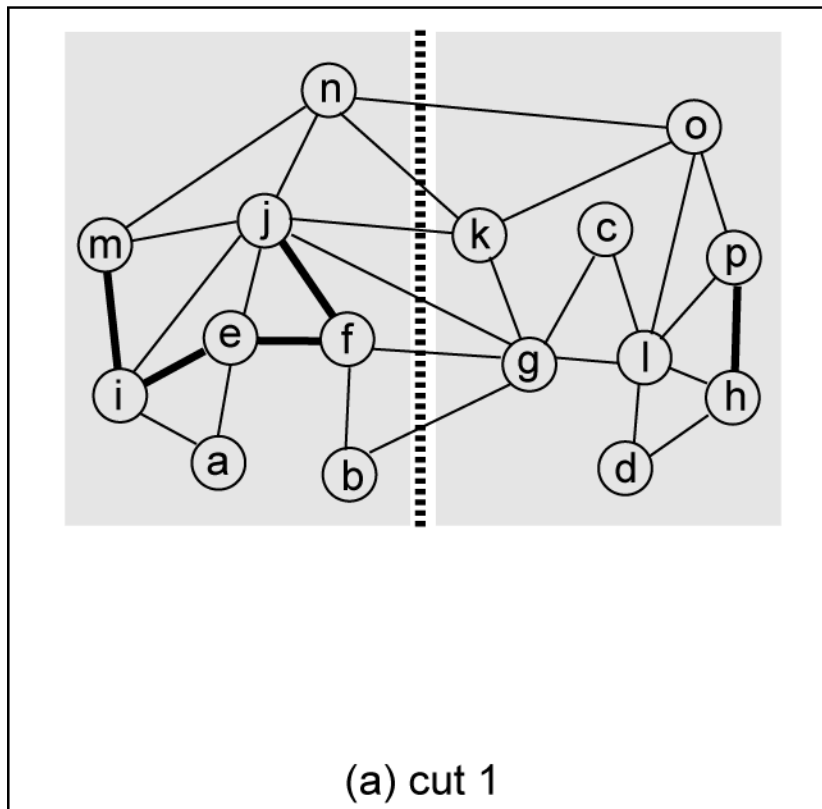
# Cut 5 and 6

- 16 partitions generated by 6 cuts
  - HPBB wirelength = 27



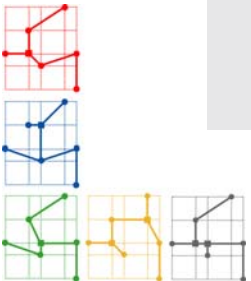
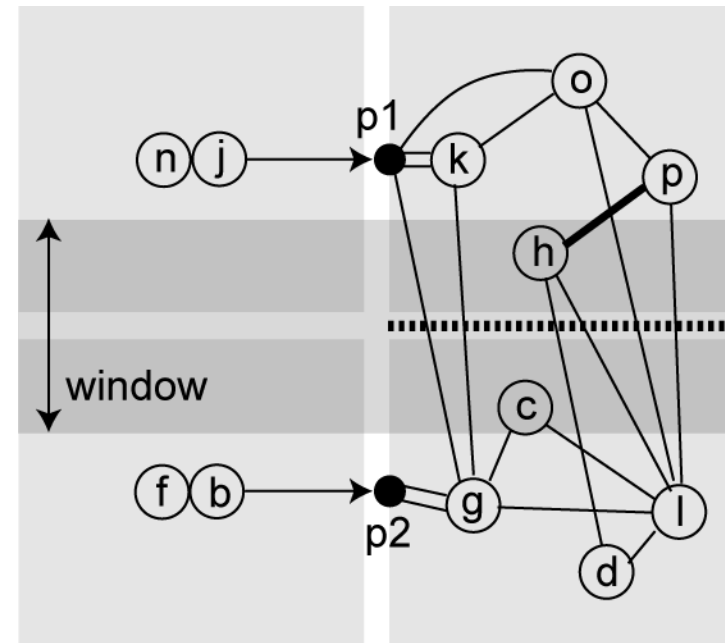
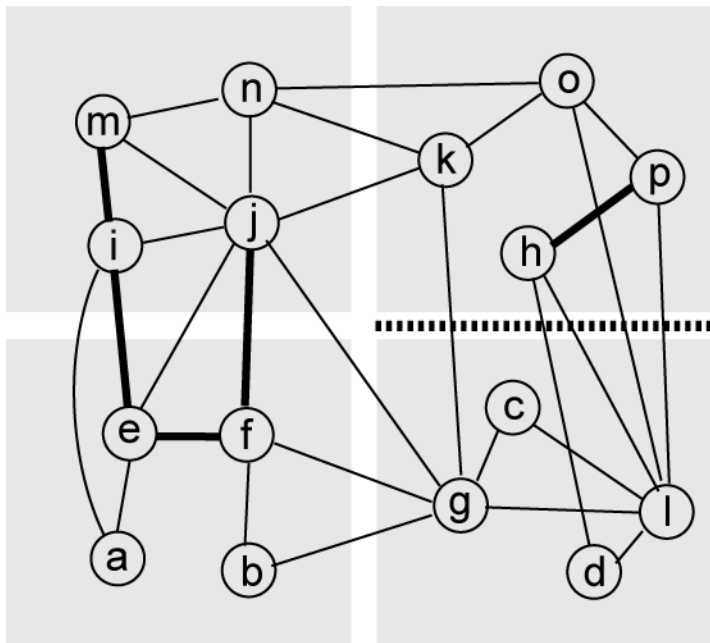
# Recursive Bisection

- Start with vertical cut
  - Perform terminal propagation with middle third window



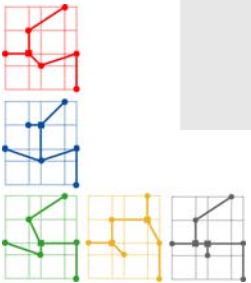
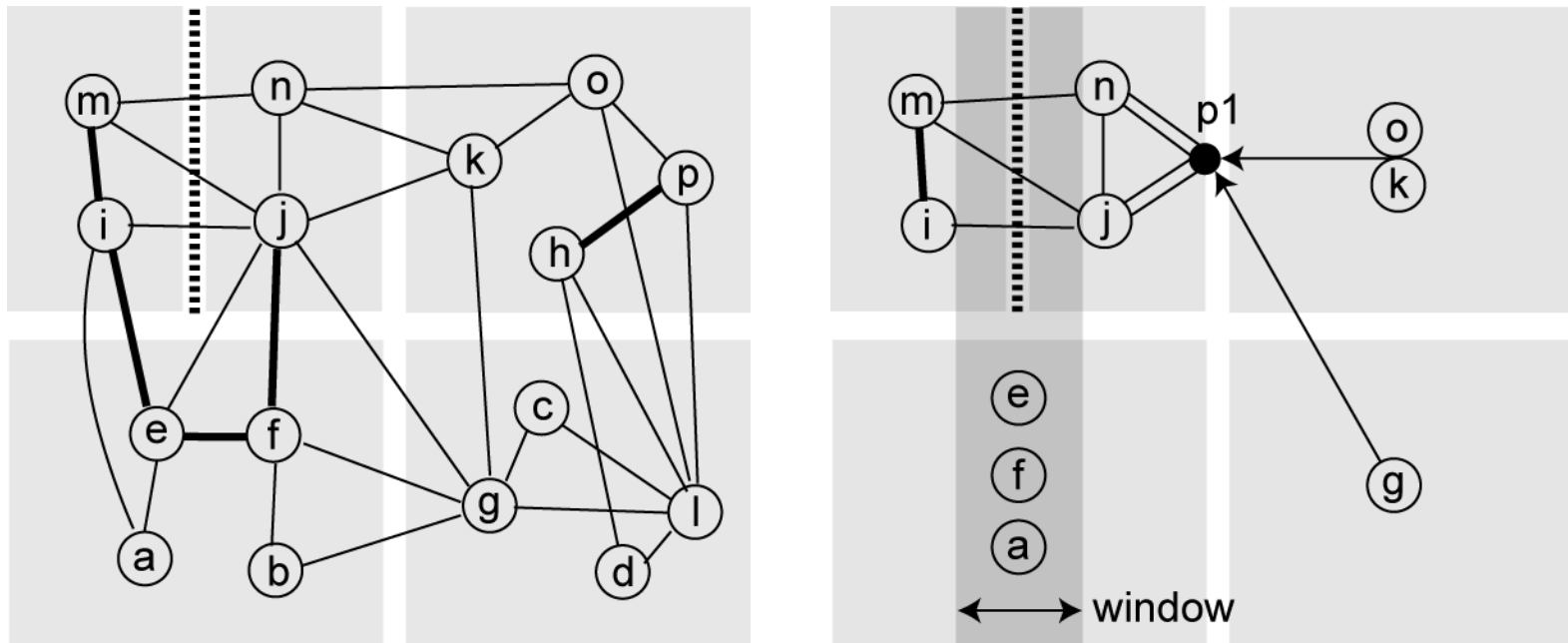
# Cut 3: Terminal Propagation

- Two terminals are propagated and are “pulling” nodes
  - Node  $k$  and  $o$  connect to  $n$  and  $j$ :  $p_1$  propagated (outside window)
  - Node  $g$  connect to  $j$ ,  $f$  and  $b$ :  $p_2$  propagated (outside window)
  - Terminal  $p_1$  pulls  $k/o/g$  to top partition, and  $p_2$  pulls  $g$  to bottom



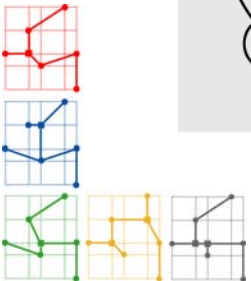
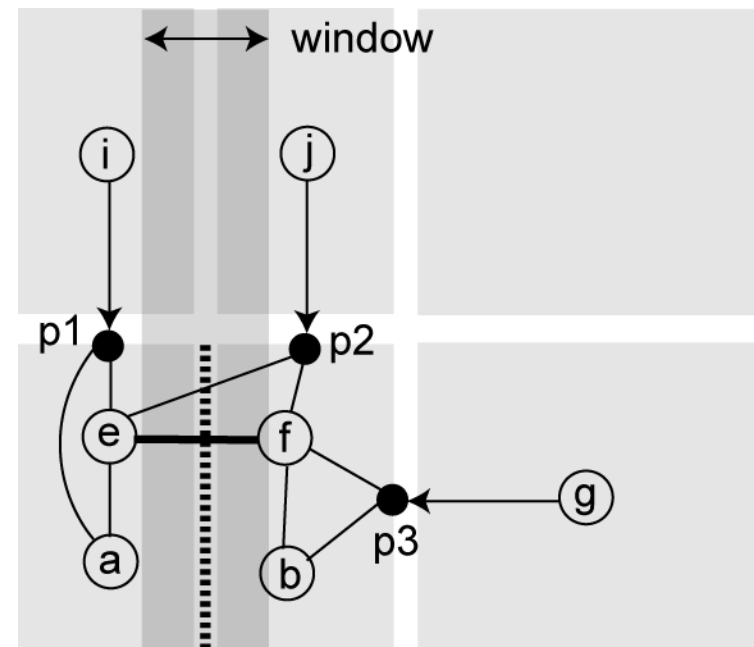
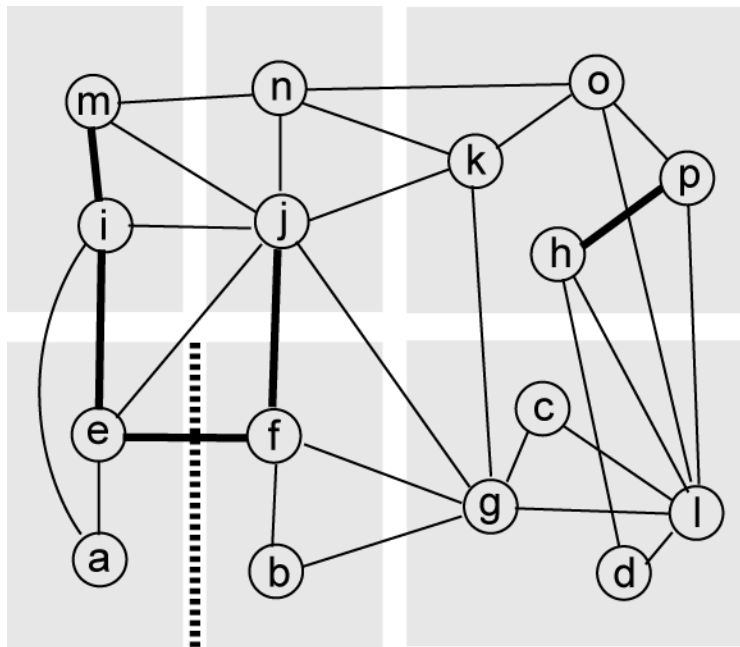
## Cut 4: Terminal Propagation

- One terminal propagated
  - Node  $n$  and  $j$  connect to  $o/k/g$ :  $p_1$  propagated
  - Node  $i$  and  $j$  connect to  $e/f/a$ : no propagation (inside window)
  - Terminal  $p_1$  pulls  $n$  and  $j$  to right partition



# Cut 5: Terminal Propagation

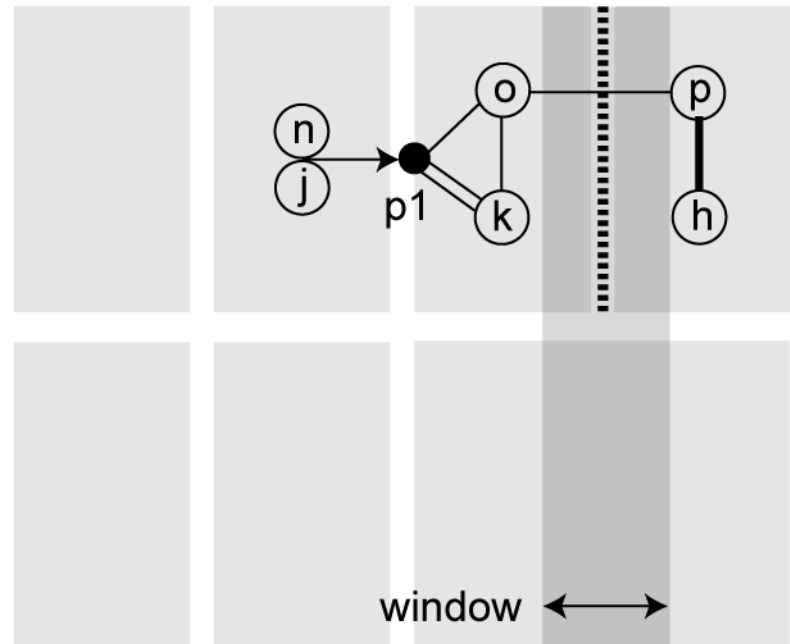
- Three terminals propagated
  - Node  $i$  propagated to  $p_1$ ,  $j$  to  $p_2$ , and  $g$  to  $p_3$
  - Terminal  $p_1$  pulls  $e$  and  $a$  to left partition
  - Terminal  $p_2$  and  $p_3$  pull  $f/b/e$  to right partition





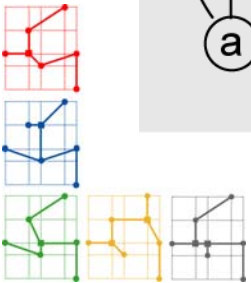
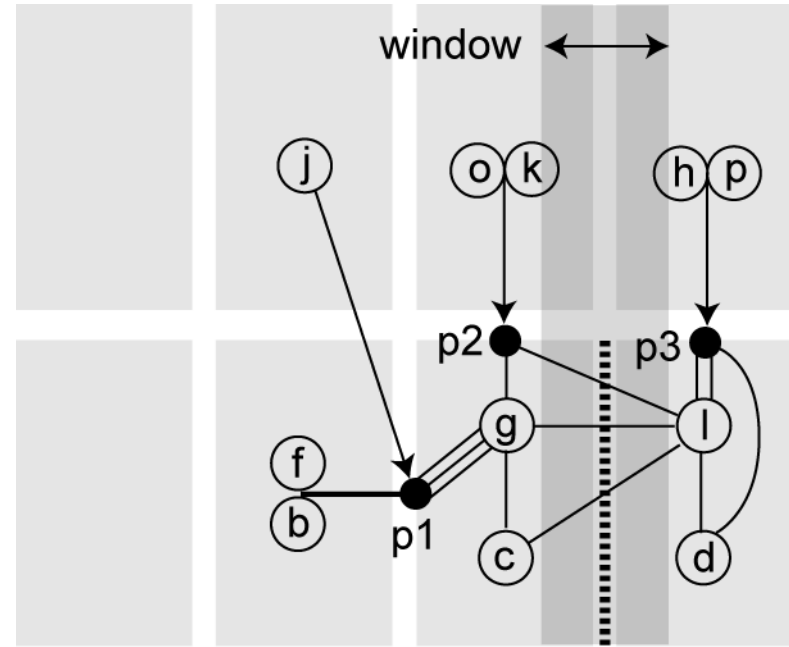
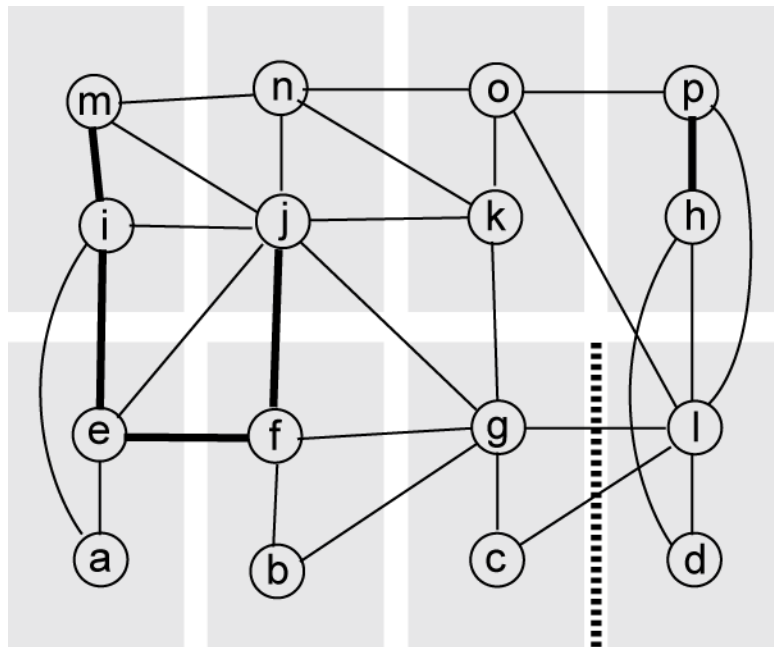
## 1. Introduction

- Node  $n$  and  $j$  are propagated to  $p_1$
- Terminal  $p_1$  pulls  $o$  and  $k$  to left partition



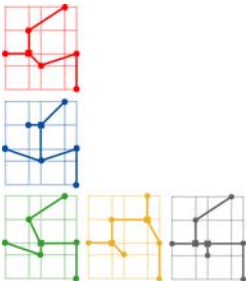
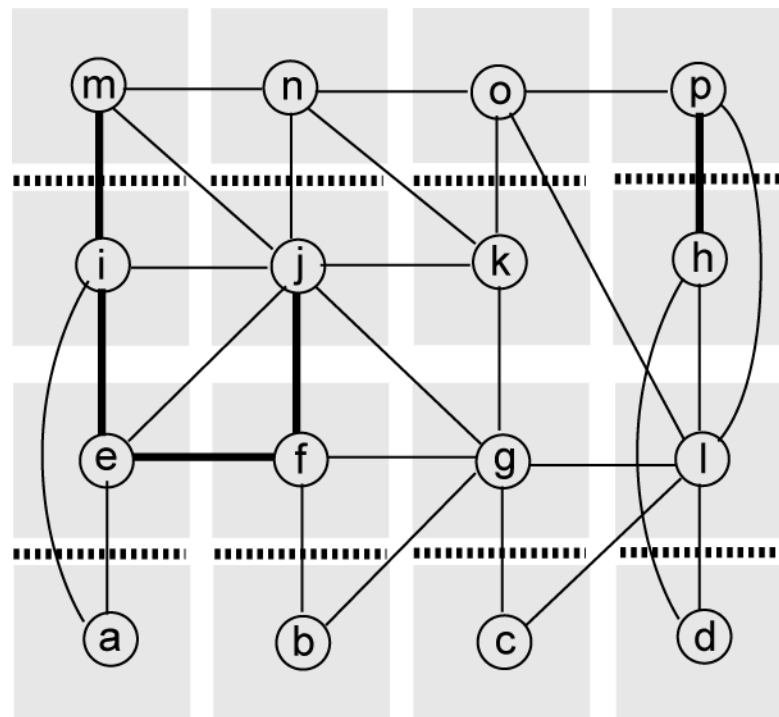
# Cut 7: Terminal Propagation

- Three terminals propagated
  - Node  $j/f/b$  propagated to  $p_1$ ,  $o/k$  to  $p_2$ , and  $h/p$  to  $p_3$
  - Terminal  $p_1$  and  $p_2$  pull  $g$  and  $l$  to left partition
  - Terminal  $p_3$  pull  $l$  and  $d$  to right partition



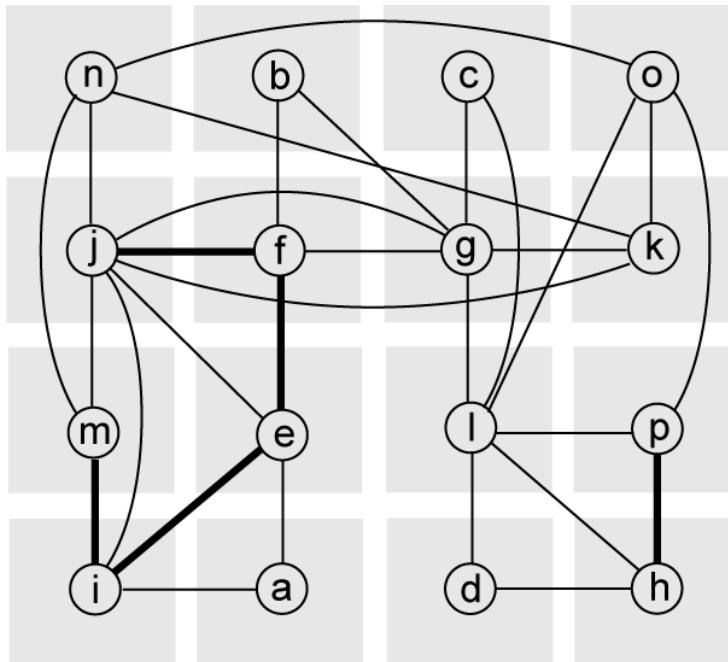
# Cut 8 to 15

- 16 partitions generated by 15 cuts
  - HPBB wirelength = 23

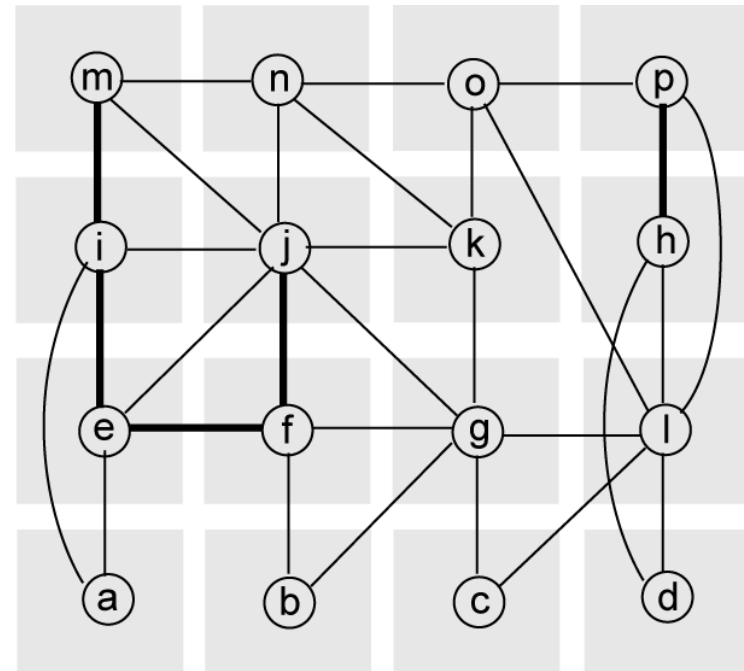


# Comparison

- Quadrature vs recursive bisection + terminal propagation
  - Number of cuts: 6 vs 15
  - Wirelength: 27 vs 23



quadrature



bisection

