

### FILLED GRAPHS

# Why

TODO Needed for perfect elimination orderings.

### **Definition**

An ordered graph is *filled* or *monotone transitive* if all higher neighborhoods induce complete subgraphs.

### Notation

Let  $G_{\sigma} = (V, E, \sigma)$  be an ordered graph.  $G_{\sigma}$  is filled if

$$u, v \in \overset{+}{\mathsf{adj}}(v) \implies \{u, v\} \in E.$$

In other word, if i < j < k so that  $\{\sigma(i), \sigma(j)\} \in E$  and  $\{\sigma(i), \sigma(k)\} \in E$  then  $\{\sigma(j), \sigma(k)\} \in E$ .

## Chordality

Proposition 1. If  $(V, E, \sigma)$  is a filled graph, then (V, E) is chordal.

*Proof.* Take the vertex with the lowest index on a cycle of length greater than three. Take  $\Box$ 

