Karger-Stein Algorithm on a Clique

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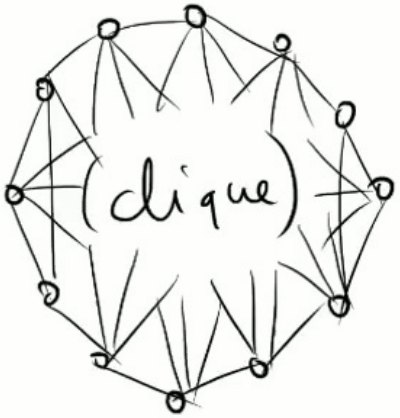

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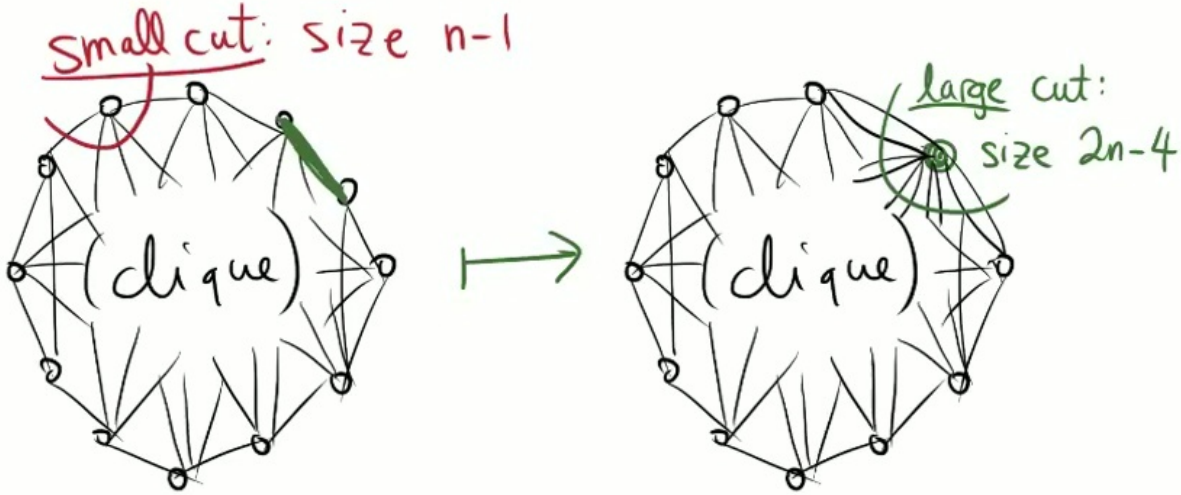

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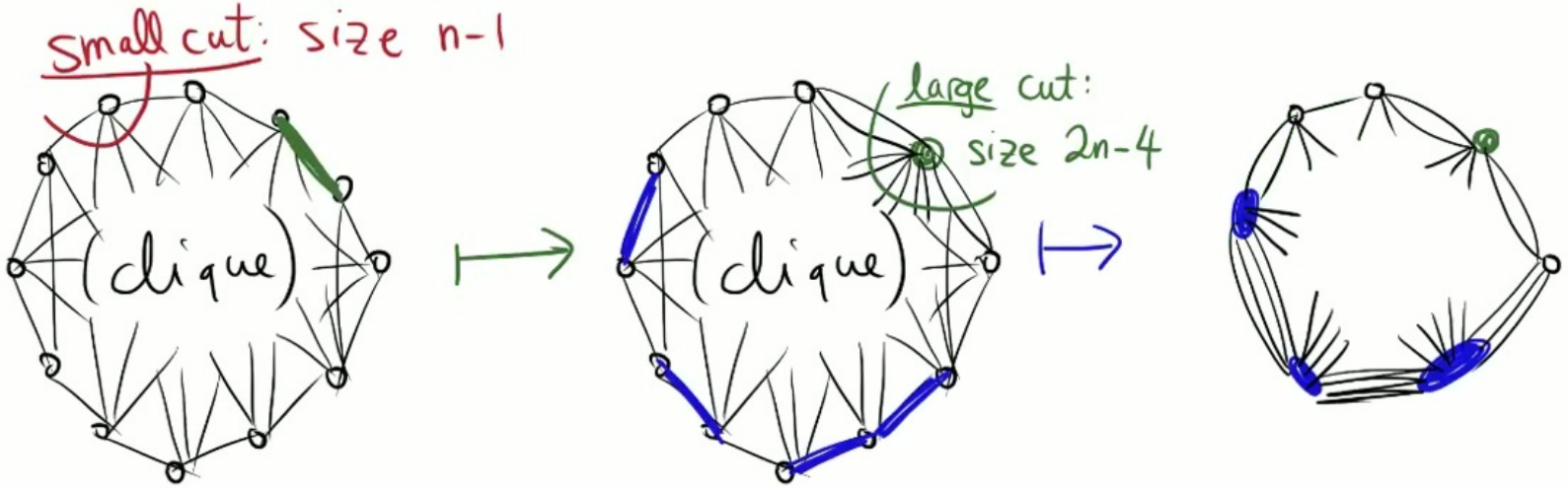

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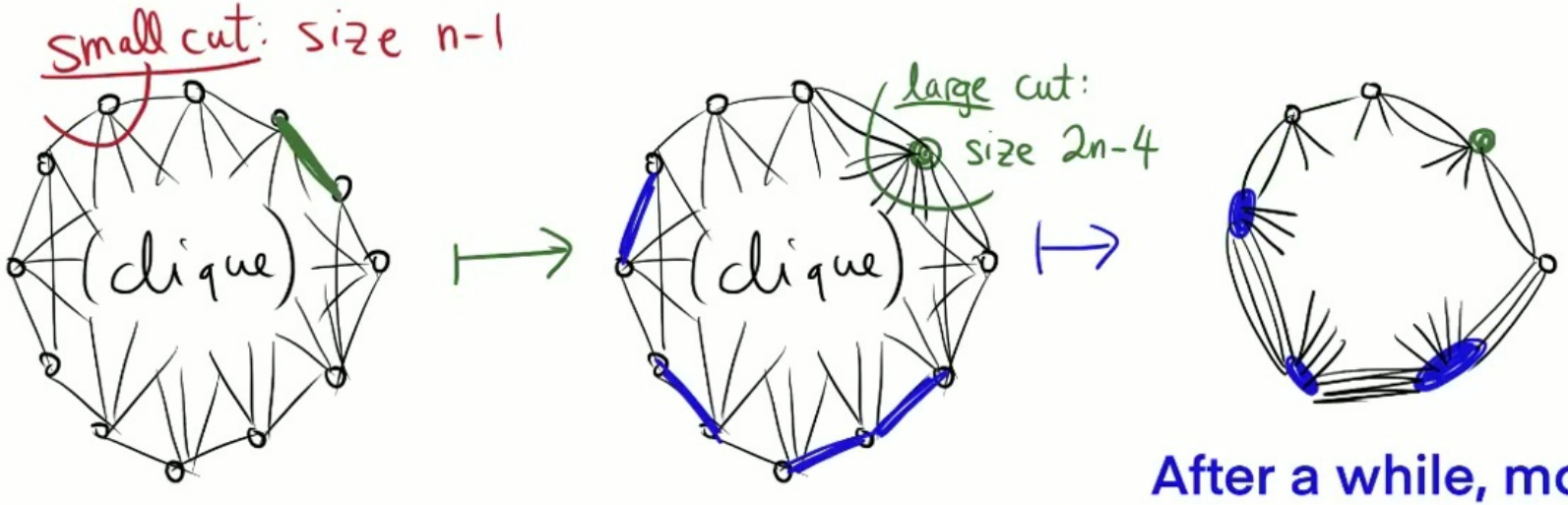

After a while, most (contracted) vertices have large (degree) cuts.

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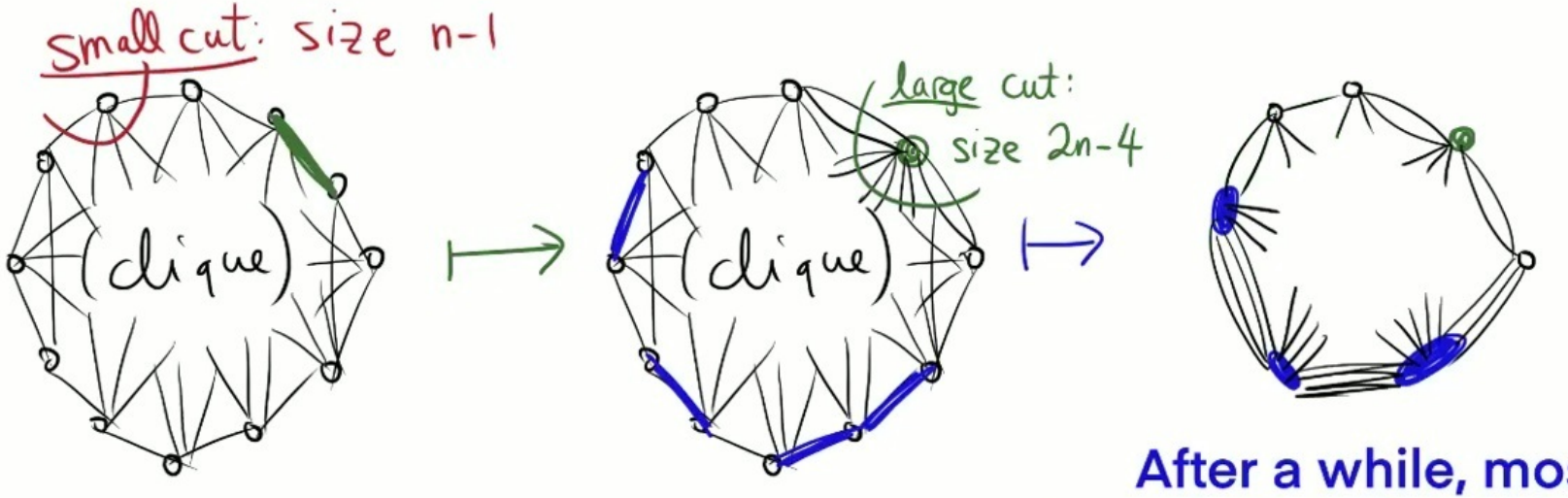

After a while, most (contracted) vertices have large (degree) cuts.

Proof: when r vertices remain, probability to contract an edge in OPT is

$$\frac{OPT}{\#\text{edges}} \leq \frac{(k-1)\cdot \text{average of smallest } k-1 \text{ degrees}}{(r\cdot \text{average of all } r \text{ degrees})/2} \leq \frac{2(k-1)}{2r}$$

$$\Pr[\text{OPT survives contraction}] \approx \prod\left(1-\frac{2(k-1)}{r}\right) \approx \exp(-2(k-1)H_n) \approx n^{-2(k-1)}$$