Property 1: Both SI+FI and EMR-SIS, for both M_e and M_g, are neutral wrt the global preferential attachment effect.

Proof: We first consider model M_e. Fix any indexing, a node i, $1 \leq i \leq N$, and a step p, $1 \leq p < N$. One has, $\forall n$, $1 \leq n < p$:

$$P(d_i^{(N)} \geqslant n+1 \mid d_i^{(p)} = n ; M_e) = 1 - P\left(d_i^{(N)} = n \mid d_i^{(p)} = n ; M_e\right)$$

$$= 1 - P\left(y_{i\,p+1} = 0, \dots, y_{iN} = 0 \mid M_e\right)$$

$$= 1 - \prod_{j=p+1}^{N} P(y_{ij} = 0 \mid M_e)$$

where the last equality comes from the fact that, in M_e, links are independently generated.

Similarly:

$$P(d_i^{(N)} \geqslant n+2 \mid d_i^{(p)} = n+1 ; M_e) = 1 - \prod_{j=p+1}^{N} P(y_{ij} = 0 \mid M_e) = P(d_i^{(N)} \geqslant n+1 \mid d_i^{(p)} = n ; M_e)$$

This completes the proof for M_e.

For M_g, it suffices to observe that the above result is true for any F, Φ and that:

$$P(d_i^{(N)} \geqslant n+1 \mid d_i^{(p)} = n ; M_g) = \iint_{F,\Phi} P(F \mid M_g)\, P(\Phi \mid M_g)\, P(d_i^{(N)} \geqslant n+1 \mid d_i^{(p)} = n ; F, \Phi)\, dF\, d\Phi$$

As $P(d_i^{(N)} \geqslant n+1 \mid d_i^{(p)} = n ; F, \Phi) = P(d_i^{(N)} \geqslant n+2 \mid d_i^{(p)} = n+1 ; F, \Phi)$, one has:

$$P(d_i^{(N)} \geqslant n+2 \mid d_i^{(p)} = n+1 ; M_g) = P(d_i^{(N)} \geqslant n+1 \mid d_i^{(p)} = n ; M_g). \qquad \square$$

We now turn to local preferential attachment, as ~~studied~~ exemplified in eg

→ [REF TO LESKOVEC SHOULD BE ADDED].