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**Considering Overtaking and Common Lines in the Bus Bunching Problem**

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\[
t_{mn} = m \tau + n(k \tau + T) + \alpha \frac{(n+m-2)!}{(n-1)!(m-1)!} \left[ \frac{k}{k-1} \right]^{m-1} \left[ \frac{1}{1-k} \right]^{n-1}
\]

(1)

\[
p_{nm(i)} = \int_0^\infty \hat{f}(\tau_{nm(i)}) \prod_{j \in L^m_{nm}, m(j) \neq m(i)} \text{Prob} \left( E(\tau_{nm(j)}) > \tau + E(g_{nm(i)}) \right) \, d\tau
\]

(2)

\[
k_{nm(i)} = \frac{\sum_{s} A_{nm(i)}^s p_{nm(i)}^s}{B_{nm(i)}}
\]

(3)

Fig. 1 Time of bus 1 (blue) and bus 2 (red) traversed through bus stops.

Fig. 2. Top: Two bus lines sharing the same stops, bottom: separate stops for both bus lines.

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