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On the modelling and performance measurement of service networks with heterogeneous customers

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A Parameters used in the fluid and diffusion approximation of section 4.3

Health state transition matrices, $i \in \{1, 2, 3\}$:

$$S_{S,1} = \begin{bmatrix} 0, 0.4, 0.6 \\ 0, 0.5, 0.5 \\ 0,\ \ 0,\ \ 1 \end{bmatrix},\ S_{S,2} = \begin{bmatrix} 0, 0.4, 0.6 \\ 0, 0.2, 0.8 \\ 0,\ \ 0,\ \ 1 \end{bmatrix},\ S_{S,3} = \begin{bmatrix} 0,\ \ 0,\ \ 1 \\ 0, 0.2, 0.8 \\ 0,\ \ 0,\ \ 1 \end{bmatrix}.$$

$$S_{L,1} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.6, 0.4, 0 \\ 0,\ \ 1,\ \ 0 \end{bmatrix},\ S_{L,2} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.6, 0.4, 0 \\ 0.6, 0.4, 0 \end{bmatrix},\ S_{L,3} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.6, 0.4, 0 \\ 0, 0.6, 0.4 \end{bmatrix}.$$

$$S_{R,i} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.2, 0.8, 0 \\ 0, 0.2, 0.8 \end{bmatrix},\ S_{U,i} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.1, 0.9, 0 \\ 0, 0.1, 0.9 \end{bmatrix},\ S_{A,i} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.2, 0.8, 0 \\ 0, 0.2, 0.8 \end{bmatrix},\ S_{O,i} = \begin{bmatrix} 1,\ \ 0,\ \ 0 \\ 0.1, 0.9, 0 \\ 0, 0.1, 0.9 \end{bmatrix}.$$

Service routing matrices:

$$R_{1,S} = \begin{bmatrix} 0, 0.9, 0 \\ 0, 0.6, 0.4 \\ 0, 0.2, 0.7 \end{bmatrix},\ R_{2,S} = \begin{bmatrix} 0, 0.9, 0 \\ 0, 0.5, 0.4 \\ 0, 0.2, 0.6 \end{bmatrix},\ R_{3,S} = \begin{bmatrix} 0, 0.9, 0 \\ 0, 0.4, 0.5 \\ 0, 0.2, 0.2 \end{bmatrix}.$$

$$R_{1,L} = \begin{bmatrix} 0.6, 0, 0 \\ 0.8, 0, 0 \\ 0.8, 0, 0 \end{bmatrix},\ R_{2,L} = \begin{bmatrix} 0.4, 0.4, 0 \\ 0.2, 0.6, 0 \\ 0, 0.8, 0 \end{bmatrix},\ R_{3,L} = \begin{bmatrix} 0.4, 0.4, 0 \\ 0.3, 0.3, 0.2 \\ 0, 0.1, 0.2 \end{bmatrix}.$$

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Table 1: Parameters used in the fluid and diffusion approximation of section 6.3.4

	Service		
Parameters	$i = 1$	$i = 2$	$i = 3$
$C(0)$	30	20	10
$\lambda_{k=1}$	10	0	0
$\lambda_{k=2}$	5	5	0
$\lambda_{k=3}$	0	3	3
$\mu_{k=1}$	2/14	4/14	2/14
$\mu_{k=2}$	1	10/14	6/14
$\mu_{k=3}$	2	1	8/14
$\theta_{k=1}$	3/14	2/14	1/14
$\theta_{k=2}$	7/14	5/14	3/14
$\theta_{k=3}$	1	7/14	4/14
$d_{k=1,F}$	3/14	2/14	1/14
$d_{k=2,F}$	7/14	5/14	3/14
$d_{k=3,F}$	1	7/14	4/14
$d_{k=1,O}$	3/14	2/14	1/14
$d_{k=2,O}$	7/14	5/14	3/14
$d_{k=3,O}$	1	7/14	4/14
$d_{k=1,R}$	6/14	4/14	2/14
$d_{k=2,R}$	1	10/14	6/14
$d_{k=3,R}$	2	1	8/14
$d_{k=1,A}$	6/14	4/14	2/14
$d_{k=2,A}$	1	10/14	6/14
$d_{k=3,A}$	2	1	8/14