Parallel batching problems

- **maximal polynomially solvable:**

$1\|outtree; p_i = p; p-batch; r_i; b < n\|C_{max}$	Parallel machine problem
$1\|p-batch; b < n\|C_{max}$	Brucker et al. (1998) [3]
$1\|tree; p_i = p; p-batch; b < n\|C_{max}$	Parallel machine problem
$1\|chains; p_i = 1; p-batch; r_i; b < n\|L_{max}$	Parallel machine problem
$1\|intree; p_i = p; p-batch; b < n\|L_{max}$	Parallel machine problem
$1\|outtree; p_i = 1; p-batch; r_i; b < n\|\sum C_i$	Parallel machine problem
$1\|tree; p_i = p; p-batch; b < n\|\sum C_i$	Parallel machine problem
$1\|p-batch\|\sum w_i C_i$	Brucker et al. (1998) [3]
$1\|p_i = p; p-batch; r_i; b < n\|\sum w_i C_i$	Baptiste (2000A) [1]
$1\|p-batch\|\sum U_i$	Brucker et al. (1998) [3]
$1\|p_i = p; p-batch; r_i; b < n\|\sum w_i U_i$	Baptiste (2000A) [1]
$1\|prec; p_i = p; p-batch\|\sum w_i U_i$	Earliest Start Schedule
$1\|p_i = p; p-batch; r_i; b < n\|\sum T_i$	Baptiste (2000A) [1]
$1\|p_i = 1; p-batch; r_i; b < n\|\sum w_i T_i$	Parallel machine problem
$1\|p_i = p; p-batch; b < n\|\sum w_i T_i$	Parallel machine problem
$1\|p_i = p; p-batch; r_i\|\sum w_i T_i$	Baptiste et al. (2004) [2]
$1\|prec; p_i = p; p-batch\|\sum w_i T_i$	Earliest Start Schedule

- **maximal pseudopolynomially solvable:**

$1\|p-batch; r_i\|\sum w_i U_i$	Baptiste et al. (2004) [2]
$1\|p-batch; r_i\|\sum w_i T_i$	Baptiste et al. (2004) [2]

- **minimal NP-hard:**

*	$1\|intree; p_i = 1; p-batch; r_i; b < n\|C_{max}$	Parallel machine problem
*	$1\|p-batch; r_i; b < n\|C_{max}$	Brucker et al. (1998) [3]
*	$1\|prec; p_i = 1; p-batch; b < n\|C_{max}$	Parallel machine problem
*	$1\|outtree; p_i = 1; p-batch; b < n\|L_{max}$	Parallel machine problem
*	$1\|p-batch; b < n\|L_{max}$	Brucker et al. (1998) [3]
*	$1\|intree; p_i = 1; p-batch; r_i; b < n\|\sum C_i$	Parallel machine problem
*	$1\|p-batch; r_i; b < n\|\sum C_i$	Single machine problem
*	$1\|prec; p_i = 1; p-batch; b < n\|\sum C_i$	Parallel machine problem
*	$1\|chains; p_i = 1; p-batch; b < n\|\sum w_i C_i$	Parallel machine problem
*	$1\|chains; p_i = 1; p-batch; b < n\|\sum U_i$	Single machine problem
	$1\|p-batch\|\sum w_i U_i$	Brucker et al. (1998) [3]
*	$1\|chains; p_i = 1; p-batch; b < n\|\sum T_i$	Single machine problem
	$1\|p-batch\|\sum w_i T_i$	Brucker et al. (1998) [3]

- **minimal open:**

$1|chains; p-batch|C_{max}$
$1|intree; p_i = 1; p-batch; r_i|C_{max}$
$1|p-batch; r_i|C_{max}$
$1|chains; p_i = p; p-batch; r_i|L_{max}$
$1|outtree; p_i = 1; p-batch; r_i|L_{max}$
$1|chains; p-batch|\sum C_i$
$1|chains; p_i = p; p-batch; r_i|\sum C_i$
$1|intree; p_i = 1; p-batch; r_i|\sum C_i$
$1|p-batch; b < n|\sum C_i$
$1|p-batch; r_i|\sum C_i$
$1|chains; p_i = 1; p-batch; r_i|\sum w_i C_i$
$1|chains; p_i = 1; p-batch; r_i|\sum U_i$
$1|chains; p_i = 1; p-batch; r_i|\sum T_i$
$1|p-batch|\sum T_i$
$1|p_i = p; p-batch; r_i; b < n|\sum w_i T_i$

- **maximal open:**

$1|tree; p-batch; b < n|C_{max}$
$1|chains; p_i = p; p-batch; r_i; b < n|L_{max}$
$1|outtree; p_i = p; p-batch; r_i; b < n|\sum C_i$
$1|tree; p-batch; b < n|\sum C_i$
$1|p-batch; b < n|\sum w_i C_i$
$1|prec; p-batch; r_i|\sum w_i C_i$
$1|prec; p-batch; r_i|\sum U_i$
$1|prec; p_i = p; p-batch; r_i|\sum w_i U_i$
$1|prec; p-batch; r_i|\sum T_i$
$1|p_i = p; p-batch; r_i; b < n|\sum w_i T_i$
$1|prec; p_i = p; p-batch; r_i|\sum w_i T_i$

References

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[3] P. Brucker, A. Gladky, H. Hoogeveen, M.Y. Kovalyov, C.N. Potts, T. Tautenhahn, and S.L. van de Velde. Scheduling a batching machine. *J. Sched.*, 1(1):31–54, 1998.