UNIPROCESSOR FEASIBILITY OF SPORADIC TASKS WITH CONSTRAINED DEADLINES IS STRONGLY CONP-COMPLETE

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ECRTS 2015

Context on the Uniprocessor Feasibility Problem





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SCP \propto *in*-Feasibility

Strongly NP-complete (Baruah et al., 1990) $|\text{SCP}| \propto in$ -Feasibility







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Sporadic Feasibility is Strongly coNP-complete

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 $(A, 2)? \rightarrow$ Yes

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SPORADIC FEASIBILITY IS STRONGLY CONP-COMPLETE

 $\mathsf{T} = \{\tau_1, \tau_2, \tau_3\}$









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Demand bound functions capture feasibility exactly! (Baruah et al., 1990)

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Feasibility and Demand Bound Functions

 $\mathsf{T} = \{\tau_1, \tau_2, \tau_3\}$





SCP instance (A, k)

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Feasibility and Demand Bound Functions



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 $A = \{ (2,4), (4,6), (3,8), (0,3) \}$







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Constructing the Demand Bound Functions



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Constructing the Demand Bound Functions



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$$A = \{ (2, 4), (4, 6), (3, 8), (0, 3) \}$$











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CONCLUSION

	General case	bounded by a constant $c < 1$
Asynchronous periodic	Strongly coNP-complete	Strongly coNP-complete
Synchronous periodic (or sporadic)	Strongly coNP-complete	? Pseudo-poly. solution exists

T T4:1: ___ +: _ ...

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∀Thank you! ⇒ ∃Questions?