

Thesis Evaluation

A discussion of review comments

Anju Srinivasan

thesis titled *A Generalization of Consecutive Ones Property*
as part of **M. S.** by Research
advised by **Dr. N. S. Narayanaswamy**
CSED, IITM, Chennai - 36

25 Mar 2013

① Reviewers

② Comments from Reviewers

Comments from Reviewer 1

Comments from Reviewer 2

③ Q&A

Reviewers

- ① **Dr. C. R. Subramaniam**
Institute of Mathematical Sciences, Chennai
- ② **Dr. Subhas Chandra Nandy**
Indian Statistical Institute, Kolkata

Comments from Reviewer 1

Missing citation

The result on characterization of TPL in the thesis is a variant of Fournier [Fou80] on characterization of hypergraph isomorphism who showed that two hypergraphs $H_1 = (V_1, X)$ and $H_2 = (V_2, Y)$ such that $|X| = |Y| = m$ are isomorphic iff there is a bijection ϕ on $I = \{1, \dots, m\}$ s.t. for every $L \subset I$, $|\bigcap_{i \in L} X_i| = |\bigcap_{j=\phi(i), i \in L} Y_j|$

Response

- Yes because feasibility of TPL requires equicardinality of intersections of at most 3 edges.
- This citation is added to Conclusions chapter Page 72.



Corrections in definitions

Comments 0, 1, 2, 3, 4

Missing conditions/terms to basic preliminary definitions in Chapter 1 and addition of Graph isomorphism definition for completeness.

Response

- Suggested changes made to definitions of Poset, Undirected graphs, Tree, Interval graph, Path graph.
- Graph Isomorphism definition has been added.
- Pages 7, 8.

Clarity of problem description (TPL)

Comment 5

Page 12, 3rd para of Sec 1.5 the idea described is not clear and precise.

Response

- An informal description of COMPUTE FEASIBLE TREE PATH LABELING and its motivation in the Introduction chapter.
- Link to formal definition in Chapter 3 added.
- Page 12.

Clarity of definition (Operator '/')

Comment 6

Definition 2.2.4(7) of binary operator “/” is not precise. What is meant by “ b is a new element added..”?

Response

- Used by [MM96] to decompose permutation of A to that of $A \setminus B$ and permutation of B .
- $A/B = A \setminus B \cup \{b\}$ if $B \subseteq A$.
- b is changed to x_B for clarity.
- Page 26, 27

Clarity of definition (Incompatibility graph)

Comment 7

Definition 2.3.1: the definition of $A_{\mathcal{F}}$ is not clear. Where is the dependence on \mathcal{F} ?

Response

- $A_{\mathcal{F}} = \{(a, b) \mid a, b \in U, a \neq b\}$ is the vertex set of the incompatibility graph of \mathcal{F} in [McC04]
- but has no dependence on \mathcal{F} , only on its universe U .
- $A_{\mathcal{F}}$ changed to A_U
- Page 36

Misunderstood definition (k -subdivided star)

A k -subdivided tree [star] is a tree with a single central vertex with a number of paths each of k edges emanating from it.

Response

- This is incorrect/a typo by reviewer.
- Def 3.2.6 clearly specifies paths have $k + 2$ vertices i.e. $k + 1$ edges.

Comments from Reviewer 2

Missing definition

The definition of k -subdivided star is not given in the thesis.

Response

- Was in fact defined in Def 3.2.6.
- Link to formal definition given at appropriate places.
- Page 13, 38

Clarity of proof

The proof of Lemma 3.3.4 is unclear.

Response

- Proof was correct but terse.
- Has been elaborated.
- Page 46

Clarity in statement of problem

In Sec 3.3 two filters are mentioned and their pseudocodes given. If possible state problem in words, explicitly state roles of filters with proper figures.

Response

- Summary of problems stated before pseudocode and narrative of filter common leaf and filter fix leaf .
- Page 44
- Refer Sec 3.4 for illustrated example with figures.

Addition of formal problem definition

The two subproblems of TREE PATH LABELING PROBLEM on arbitrary trees are not formally defined. Given description is with several notations and the motivation is unclear.

Response

- Notations necessary - long abstract theory set up cannot be avoided..
- Formal definitions added FIND OVERLAP COMPONENT PARTITION SUBTREES , FIND MUB FEASIBLE TPL
- Motivation summarised before long theory set up
- Page 61, 66

Thank You

Q & A



J.-C. Fournier.

Isomorphismes d'hypergraphes par intersections équi-cardinales d'arêtes et configurations exclues.
J. Comb. Theory, Ser. B, 29(3):321–327, 1980.



Ross M. McConnell.

A certifying algorithm for the consecutive-ones property.
In *SODA: ACM-SIAM Symposium on Discrete Algorithms (A Conference on Theoretical and Experimental Analysis of Discrete Algorithms)*, 2004.



J. Meidanis and E. G. Munuera.

A theory for the consecutive ones property.
In *Proc. of the III South American Workshop on String Processing*, volume 88, pages 194–202, Recife, Brazil, 1996.