

# 國立中山大學應用數學系

## 學術演講

講者：Professor Jing Huang  
University of Victoria, Canada

(第一場)

講題：Completing orientations of partially oriented graphs

時間：2019/06/14 (Friday) 10:10 ~ 11:00

地點：理學院四樓理 SC 4027 室

茶會：10:00 於理 SC 4010 室 (系辦公室)

### Abstract

For a fixed class  $C$  of oriented graphs, the orientation completion problem asks whether a given partially oriented graph  $G$  can be completed to an oriented graph in  $C$  by orienting the (non-oriented) edges in  $G$ . Orientation completion problems commonly generalize several existing problems including recognition of certain graph classes as well as extending representations of certain geometrically representable graphs. We study orientation completion problems for several well-studied classes of oriented graphs. We show that the orientation completion problem for one of them is NP-complete, and for each of other classes is polynomial time solvable by employing the standard orientation technique for the class. We also study minimal partially oriented graphs that cannot be completed to an oriented graph in a desired class. This talk is based on joint work with J. Bang-Jensen and X. Zhu.

(第二場)

講 題：Cocomparability bigraphs

時 間：2019/06/14 (Friday) 11:10 ~ 12:00

地 點：理學院四樓理 SC 4027 室

茶 會：10:00 於理 SC 4010 室 (系辦公室)

### Abstract

We propose bipartite analogues of comparability and cocomparability graphs. Surprisingly, the two classes coincide. We call these bipartite graphs cocomparability bigraphs. We characterize cocomparability bigraphs in terms of vertex orderings, forbidden substructures, and orientations of their complements. In particular, we prove that cocomparability bigraphs are precisely those bipartite graphs that do not have edge-asteroids; this is analogous to Gallai's structural characterization of cocomparability graphs by the absence of (vertex-) asteroids. Our characterizations imply a robust polynomial-time recognition algorithm for the class of cocomparability bigraphs. Finally, we also discuss a natural relation of cocomparability bigraphs to interval containment bigraphs, resembling a well-known relation of cocomparability graphs to interval graphs. This is joint work with P. Hell, J. Lin and R. McConnell.

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