Complexes of behaviours

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Given a partial differential system, i.e. a matrix of partial differential operators, the problem considered here is to embed it in a two sided complex with "minimal" cohomology. This problem includes as two special cases, the problems of determining when the kernel of a differential system is an image, and when its image is a kernel (i.e. the vanishing of the cohomologies at levels 0 and 1). These problems correspond to the problem of determining whether a behaviour is controllable and the problem of eliminating latent variables in a hybrid representation of a behaviour. This paper also explains the system theoretic significance of the vanishing of the cohomologies at other levels.

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