

Mobile Processes and Call Channels with Variant Interfaces (a Duality)

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Abstract. The current model of mobile processes in `occam- π` implements a *single* interface for host processes to use. However, different hosts holding different kinds of resource will naturally require different interfaces to interact with their visitors. So, current `occam- π` mobiles have to offer a single union of all the interfaces needed and hosts must provide dummy arguments for those irrelevant to its particular calls. This opens the possibility of programming errors in both hosts and mobile should those dummies mistakenly be used. This paper considers a revised model for mobile processes that allows *many* interfaces. It also proposes the concept of *variant call channels*, that expands on a mechanism proposed for the `occam3` language, and shows a simple duality between the revised mobile processes and mobile variant call channels. An implementation of mobile variant call channels, via source-code transformation to standard `occam- π` mobile channel bundles, is presented. This gives a demonstration implementation for the revised mobile process model and an operational semantics. The paper is illustrated with a case study based on the Santa Claus problem, where the elves and reindeer are mobile processes.

Keywords. Mobile processes, call channels, variant interfaces, `occam- π` , protocols, channel bundle.