Invariants and multiple point spaces of singularities

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One of the main goals in singularity theory is the local classification of map germs according to the action of some group, this study began in the middle of the twentieth century thanks to the works of Whitney, Thom and Arnol'd. This theory has made great strides in the last years thanks to the study of numerical invariants that allow to determine when families of germs belong to the same class according to the action of some fixed group. A key example is the Milnor number, whose constancy in families of function germs, under certain conditions, determines the topological classification of these germs. For map germs other invariants arise naturally in this study, the "stable singularities". They appear in a stable deformation of a map germ and in this case we can cite the "number of cusps" and the "number of double folds" of map germs from the plane to the plane, studied by Whitney in one of the works considered pioneer in this theory. A key tool in the study of the geometry, as well as the topology of the stable singularities is the description of the multiple point spaces, these spaces play an important role in the study of the image or discriminant of a stable perturbation. In this talk we shall explore these concepts for map germs from $\mathbb{C}^n$ to $\mathbb{C}^p$, with n and $p = 2, 3$, showing several examples and the principal invariants that appear in these dimensions.