Version Control System (VCS) techniques for managing the creation of 3D computer generated models exist for static 3D models. There are no solutions for revision control of the animation data from animated 3D models. VCS’s for data created by multiple users require two types of operations to exist as a precondition:
- A method to compare different versions of the data and to identify differences between them,
- A method for merging these different versions of the data in a meaningful manner.

To this end, we propose a novel 3-way difference, merging and conflict resolution technique for 3D animation data that satisfies these criteria for a 3D animation data VCS.

### 2 Way Difference
To calculate the 2-way difference of master and branch animation:
\[ \Delta A = 2\text{Way}(A_m, A_a) = \{\Delta k_0, \Delta k_1, \ldots, \Delta k_n\} \]
we compare the difference kinematic hierarchy for each frame:
\[ \Delta k_i = \{\Delta j_0, \Delta j_1, \ldots, \Delta j_n\} \]
This requires identifying the differences between joint transformations:
\[ \Delta j_i = \{\Delta p, \Delta s, \Delta r\} \]
This includes the differences for Position: \[ \Delta p = p_a - p_m \]
Scale \[ \Delta s = s_a - s_m \]
and Rotation \[ \Delta r = r_a \cdot r_m \]

### Merging
A useful mechanism in version control is the ability to merge two versions of an item descended from a common ancestor together into a new, blended version. By employing the 3-way difference data, we can apply the delta values to the master animation to produce a new merged animation:
\[ A' = A_m + \Delta A_{a,b} \]