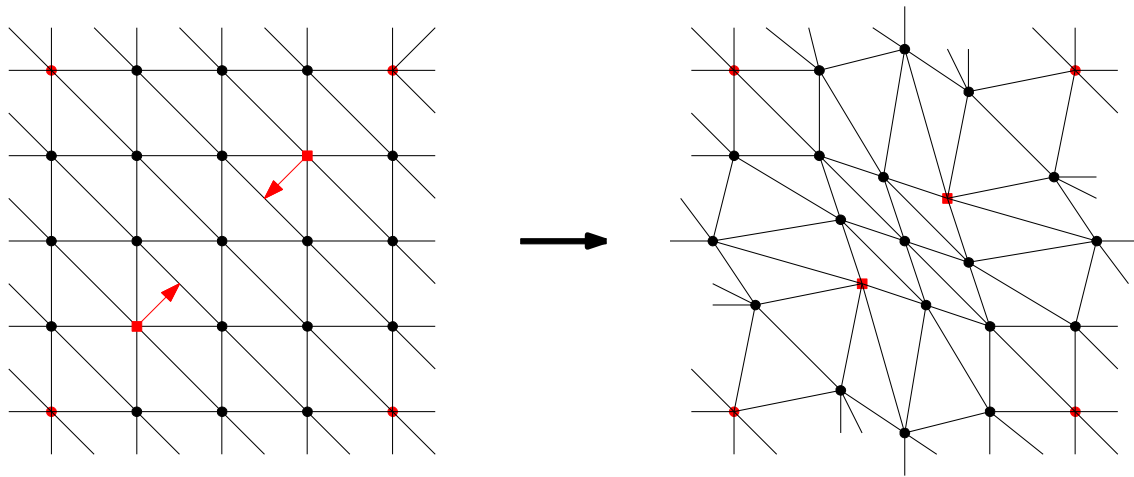


1. Facial animation using current H-Anim
 - Based on H-Anim standard (ISO/IEC 19774:2005),
 - A Displace object can be used for facial animation, such as
 - First, vertices corresponding to a feature on a mesh are specified,
 - Second, the displacer objects for the feature vertices specify locations, called morph targets.
 - Finally, the mesh is morphed smoothly by the specified displacer objects.
 - [Question] According to clause 4.7 in 19774:2005, “In the case of a face, there might be a Displacer object for each facial expression.” Is it possible to define a facial expression by only one single displacer? In this case, does the expression mean a kind of smile, sad, joy, or so?



2. Restrictions on current H-Anim
 - A facial animation can be created by defining the sequences of displacers' field, displacements.
 - If there exists a facial animation externally created by an animation tool, the facial animation can be represented by the sequence of facial vertices motions.
 - Given an existing vertex animation,
 - How can one select a subset of vertices to be defined as displacers?
 - How can one specify the displacements of displacer objects?
 - Even though it is possible, a lot of vertices may be selected as displacers for high quality facial animation.
 - Selecting a small number of displacers may lead inaccurate facial animation compared with the original high quality facial animation.
3. Standardization item for facial animation
 - [Proposed] Facial animation

- From a sequence of vertex animation, several regions are defined by grouping vertices. These can be semi-automatically determined by PCA (Principal Component Analysis) or manually determined from standard feature points such as MPEG4 FP.
- A region is defined by a set of boundary vertices and internal vertices.
- The positions of internal vertices are defined by the 3D mean value coordinates with respect to the boundary vertices.
- For each region, one or a few vertices are selected as displacer objects.
- Then, the motion of boundary vertices is parameterized by the motion of the displacer object. Here, this parameterization requires the full set of vertex animation and is represented by a matrix.
- As the displacer vertex moves, the positions of boundary vertices are determined by the parameterization, and finally the positions of internal vertices are determined preserving their mean value coordinates.
- Region-based facial feature definition instead of MPEG4 feature points for a face.
- Standard conversion method (or tool) from a facial animation externally created to a facial animation in H-Anim.
- Together with H-Anim displacer object which is used for morphing, another type of object can be introduced for parameterized facial animation.