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Modeling Concept of Human Face Objects

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تصور بناء نموذج للوجه البشري

ملخص : إن من أهم المشاكل التي يعاني منها مجال الرسوم باستخدام الحاسوب هي بناء وحركة الأجسام الحية.

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ففي هذه الورقة نعرض نموذج لبناء الوجه البشري مما ينتج عنه عدد قليل من المتغيرات تحدد ملامح هذا الشيء ليمكننا من استخدامها في انشاء الشيء المتحكم به.

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ولقد أصبح هذا ممكنا عندما ابتدع الفصل بين الأشكال ثنائية البعد و النصوص تمثيل واقعي للصور ونعومة التوافق بين الصور وخصائصها، فبهذه الطريقة يمكن للمستخدم أن يرى الصورة وأجزاؤها الصغيرة بناءاً على هذه المعايير.

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وفي نهاية المطاف فإن هذا النظام سيقوم بتوفير الوظائف الجوهرية لتجميع مكونات الوجه البشري الصغيرة للحصول عليه .

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Abstract: A major problem in computer graphics is the construction and animation of realistic human models [1, 2, 3]. This paper presents methods to model human face objects. This process results in a small set of parameters. Which characterizes the object, that can be used in simple ways to generate controlled morphing. This becomes possible because separation of 2D-shape and texture provides a faithful closed representation of images and smoothes the mappings between images and their properties. With this approach, the user watches an image being morphed according to these indications. The final system provides functionalities for generating human face objects, which can be gathered to build the face.

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Introduction

The complexity of the models used in computer graphics increases constantly [4, 5]. A human face model is needed to generate phantom photos by the police, the kids, etc… Another practical application is in visual communication via the Internet. However, since the main subject in visual communication (e.g., videophone) is a human head, more efficient method (a model) is needed than video sequences to achieve an efficient visual communication that use representative facial parameters. There has been a large amount of research on face modeling and animation. One main task of face modeling is to develop a facial deformation control model for spatially deforming facial surface [6].

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A model is a rough estimation or a simulation of the reality. A model typically stores description of primitives (points, lines, curves and polygons on 2D or 3D and free-form surfaces in 3D) that define the shape of the object. Object attributes such as line style; color and surface texture,

connectivity relationships and positioning data describe how the components fit together [7, 8].

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Models are application-specific, which created independently of any particular display system. There for the application program must convert a description of the portion of the model to be viewed from the internal representation of the geometry (whether stored explicitly in the model for derived on the field) to whatever procedure calls or commands the graphics system uses to create an image.

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My Approach

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The goal of the work is to model human face objects. The human face objects are to be modeled as parameterized geometric models. Once the parameters of the control points of the form model are decided, the remaining vertices on the model are deformed by interpolation. However, little research has been done in a systematic way to address how to chose interpolation functions, how to adjust control points, and what are the correlations among those control points. Parameterized geometric models calculate the coordinates of the vertices by a set of predefined functions. Nonetheless, there is no theoretical basis for designing those functions.

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Modeling Methodology

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Any image can be described in 3-D space in terms of its height, width and depth. However, since the display surface is flat, the result must be 2-D. Thus, a 3-D object must be reduced to 2-D (wireframe) prior to display. The primary difference between “2-D” and “3-D” is that 2-D pictures appear flat, and 3-D pictures appear to have volume. In addition, 3-D objects are still created from the same 2-D primitives [12, 13].

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A model in graphics is a collection of graphics objects that represent a scene or a more complex object. There is a general model type in graphics, wireframe. A wireframe model approximates the surface shape of an object by specifying a set of points in space (the vertex list) and by connecting various pairs of them to form edges (the edge list). Wire frame looks skeletal and hollow, only suggesting the shape of the object [16, 17].

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The Human face consists of many objects eyes, mouth, etc. To model any of these objects, we have to find out a set of points that characterizes it and how to build the wireframe from them. In the next sections, first I will discuss different ways to connecting the vertices and then how to get the characterizing points for each object.

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Geometry

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Suppose we have the characterizing points of a Human face object, we still have to solve the problem how to draw the curved shape from that points, it is often necessary to create complex curves based on control points. In this

section, some methods used to draw curved shapes such as ellipses, draw arc, polygons and Splines will be studied.

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Ellipse

Human face can be raff modeled using ellipse (Figure 1). Funny faces may be seen on the Internet and funny shows.

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