covering an orthogonal polygon with dents in three directions with a minimum number of orthogonally convex polygons. The general case of covering a simple orthogonal polygon with a minimum number of orthogonally convex polygons remains open.

Two kinds of visibility for orthogonal polygons have been studied in the literature [5]. Two points of the polygon are said to be *s*-visible if there exists an orthogonally convex polygon that contains the two points. Two points of the polygon are said to be *r*-visible if there exists a rectangle that contains the two points. This gives us two classes of star covers for orthogonal polygons. An *s*-star polygon contains a point p, such that for every point q in the polygon, there is an orthogonally convex polygon containing p and q. An *r*-star polygon is similarly defined. Thus, an *s*-star cover is a cover by *s*-star polygons and an *r*-star cover is a cover by *r*-star polygons.

For *r*-star covers, Keil [14] has provided an $O(n^2)$ algorithm for covering a horizontally convex orthogonal polygon with a minimum number of *r*-stars. For *s*-star covers, Culberson and Reckhow [5] provide an $O(n^2)$ algorithm for covering an orthogonal polygon with only two dent orientations with a minimum number of *s*-stars. Since this paper does not deal with *r*-star coverings, the word star will be taken to mean an *s*-star.

The purpose of this paper is three-fold: we first show that for the case where the orthogonal polygon has all four dent orientations, the covering problem can be formulated and solved as the problem of finding a minimum clique cover for a weakly triangulated graph [11]. Since weakly triangulated graphs are perfect [11], we obtain the following duality relationship: the minimum number of star polygons needed to cover an orthogonal polygon P is equal to the maximum number of points of P, no two of which can be contained together in a covering star polygon. Further, the Ellipsoid Method of Grötschel, Lov´asz and Schrijver [10] gives us a polynomial algorithm for this covering problem. We then show that the problem of covering orthogonal polygons with three dent orientations with a minimum number of star polygons can be formulated and solved by finding a minimum clique cover for triangulated (chordal) graphs [9, 15]. This gives us an $O(n^3)$ algorithm.

Finally, we wish to make the point that perfect graphs play a crucial role in polygon covering problems. In fact, the main emphasis of this paper is to exhibit this relationship rather than provide the most efficient algorithms. For instance, in the case of covering with orthogonally convex polygons, when the orthogonal polygon has only three dent orientations, the underlying graph defined in [18] is perfect. This helps us to solve the problem. However, when the polygon has all four dent orientations, the same graph is no longer perfect, and the problem is still open. We are also convinced that for covering orthogonal polygons with *r*-stars, the perfect graph approach presented in this paper