

On the Idea of Design: Analyzing the Ideal Form of Cars

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Abstract. This paper calls the Renaissance the ‘Golden Age of Design’ due to the high meaning of the original design theory. It seeks to answer the question what was the ‘Idea’ behind ‘Disegno’. To achieve this, we analyze different books of the Classical Antiquity and the Renaissance that were mainly important for its invention. Then, the paper will introduce an investigation concept, which takes the peculiarities of the original design into account. Finally, parts of the proposed concept will be tested by analyzing the ideal form of cars.

Keywords: Disegno, Design theory, Renaissance, Design philosophy, Platonic Idea, car, automobile.

1 Introduction

By recognizing the marvelous artworks of the Renaissance – such as the works of Brunelleschi, Da Vinci or Michelangelo – it is interesting to know that the concept of design (*Disegno*) was mainly responsible for a higher status of the visual arts. During medieval times, the departments of knowledge were divided into two categories: arts of the mind *Artes Liberales* (‘Liberal Arts’) and arts of the hand *Artes Mechanicae* (‘Mechanical Arts’). While the Liberal Arts were taught in the medieval universities, the Mechanical Arts were placed below them in the hierarchy of knowledge and thus their subjects were excluded from universities. Architecture, painting and sculpture were placed amongst the mechanical arts and therefore they had a low position in the hierarchy of knowledge. For this reason, scientists and artists of the Italian Renaissance battled to elevate their status. Interestingly, in contrast to most scholars, Giorgio Vasari tried to find an agreement and harmony between the visual arts and found it in the concept of design. He declared architecture, painting and sculpture as its arts - (*arti del disegno*). With this concept, the visual arts were no longer rivals, but *‘sisters, born of one father’* – design. They were no longer *‘arts of the hand’* but, through design, theoretical constructs. Consequently, the door was opened for the first art academy in Europe. Under the major influence of Vasari, the Florentine *Accademia delle Arti del Disegno* (‘Academy of the Arts of Design’) was founded in 1563.

Design was one of the central concepts of the Renaissance period. It was the foundation and theory of all fine arts, the creative power needed to develop ‘never-before-seen’ things and thus the light of all inventions. Due to its high meaning, we call the Renaissance the ‘*Golden Age of Design*’. The paper aims to answer the question what was the ‘*Idea*’ behind ‘*Disegno*’. Therefore, we select important sources of the Classical Antiquity and Renaissance in order to understand the movements for the invention of the original design. Next, the paper presents a concept that focuses on the investigation of ‘*Idea*’ of things. Finally, we test parts of the concept by analyzing the ideal form of cars.

2 On the Analysis

To gain a better understanding of why the original design concept was developed we performed two different analyses. Both of them are proposed in recently related works [13][14] and thus this paper will describe them shortly. The first one, called ‘*Litterarum Lumen*’, analyses the movement, which originated from Petrarch, the father of the intellectual and literary movement ‘*Humanism*’. As Burckhardt points out, literature preceded the visual arts and gave them their main impulse [8]. Hence, the analysis includes the work of six important Renaissance humanists and of six authors of the Classical antiquity, which mainly influenced the humanistic movement. It focuses on the following classical subjects: poetry, rhetoric and philosophy. Figure 1 represents the selected authors for the analysis.

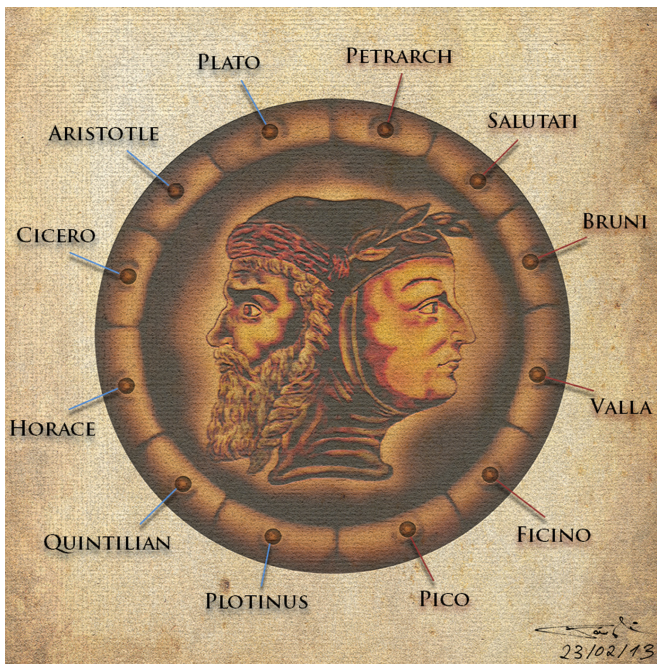


Fig. 1. Selected authors for the analysis ‘*Litterarum Lumen*’

The second analysis is called '*Arti del Disegno*' and focuses on the visual arts '*Architecture*', '*Painting*' and '*Sculpture*'. The selected books for the analysis did not only deal with the mentioned arts, but have also significantly influenced the original meaning of design. The aim of the analysis is to characterize why design was of such great importance during the Renaissance period. Moreover, it builds also the connection to the first analysis '*Litterarum Lumen*' with the aim to characterize, how the '*light of literature*' shined over the visual arts. As depicted in Figure 2, six important authors are included – beginning with Marcus Vitruvius Pollio, who is known as the father of architectural theory and ending with Giorgio Vasari, the father or art history and design.

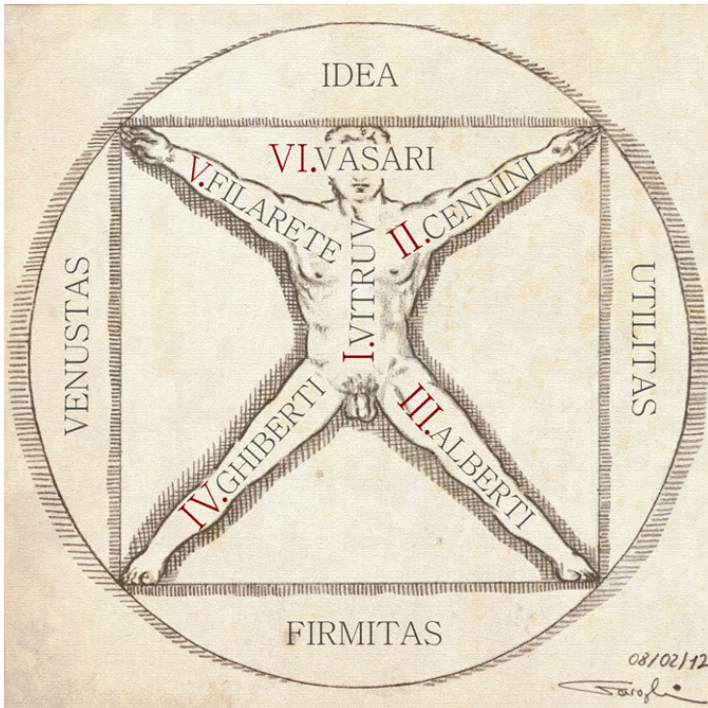


Fig. 2. Selected authors for the analysis '*Arti del Disegno*'¹

3 The Idea of Disegno

Based on the analyses, the characteristics and '*Idea*' of the original design theory ('*Disegno*') can be summarized as follows: '*Disegno*' was regarded as the '*knowledge of forms*' and the '*foundation*' of all created things. According to Filarete, it was useful for the creation of '*correct*' and '*worthy*' things [6]. Inspired by Aristotle and

¹ For details cs. [14]

Pliny the Elder, it was not only a useful science, but also a noble and *'liberal'* one [5] [18]. For example, Aristotle wrote the following words in his book on *'Politics'*: “*to be always seeking what is useful, is unworthy of a liberal, and inconsistent with an elevated, character*” [5, p. 299]. For this reason, *'Disegno'* was a noble science, because it had the power for discovering *'countless beauties'* [6]. Furthermore, the ancient philosophy of *'form'* and *'matter'* was of great importance for the theory of *'Disegno'*. Plato, Aristotle and Plotinus defined form as the principle of matter. For Aristotle, all things could only be created, if the form pre-exists in the mind of the creator [3]. This philosophy was especially used in the Renaissance theory of architecture. According to Alberti, the art of building was composed into two parts: *'Disegno'*² and *'construction'* [2]. While *'Disegno'* was related to form, the act of *'construction'* was associated to matter. Hence, *'Disegno'* was separated from the act of construction. Moreover, it was defined as an intellectual activity and thus it was the work of the *'mind'* and not of *'hand'*. Based on the Renaissance theory, the main work of an architect is therefore to plan and form the building and not to construct it. The superiority of form over matter can be shown with the analogy between God and nature. For Ficino, God is “*the creator of all forms*” and nature “*the craftsman of the world*” [16, p. 19]. For this reason, Vasari and Zuccari characterized God as a designer who formed the things of nature after an *'Idea'*. Interestingly, Zuccari argued that *'Disegno'* has the following etymological meaning: *'Segno di Dio'* (*'Sign of God in Man'*) [23]. Only through *'Disegno'*, man is able to create *'a new or second World'*. Finally, this can be defined as the *'Idea'* of *'Disegno'*: to create a *'Golden World'* or a *'Paradise on Earth'*.

4 Investigating the Idea of a Thing

One of the peculiarities of *'Disegno'* was to form a thing according to the *'Idea'*. Hence, a designer should be able to understand the *'principles'* and *'hidden secrets'* of nature and thus be able to invent something new. Moreover, by seeing the ideal forms, he is able to complete something to perfection. The Renaissance scholars were mainly inspired by Cicero who wrote in his book *'De Oratore'* (*'On the Orator'*) that every study should focus on the *'Platonic Idea'* and should thus create a clear image of the ideal form of the analyzed subject [11]. Therefore, during the Renaissance period, this goal was not limited in *'Disegno'* and visual arts, but also used in literature. For example, they built an image of an *'ideal orator'*, *'ideal courtier'*, *'ideal city'* or *'ideal palace'*. Hence, we analyzed how the Renaissance scholars investigate the *'Idea'* of a thing. Based on this, we developed a concept that considers the peculiarities of that time. Our proposed concept is depicted in Figure 3.

² Alberti did not use the Italian term *'Disegno'* in his treatise *'De re aedificatoria'* (*'On the Art of Building'*), because it was written in Latin. But Cosimo Bartoli translated his treatise into Italian in 1550 and replaced the term *'lineamento'* with *'disegno'*.

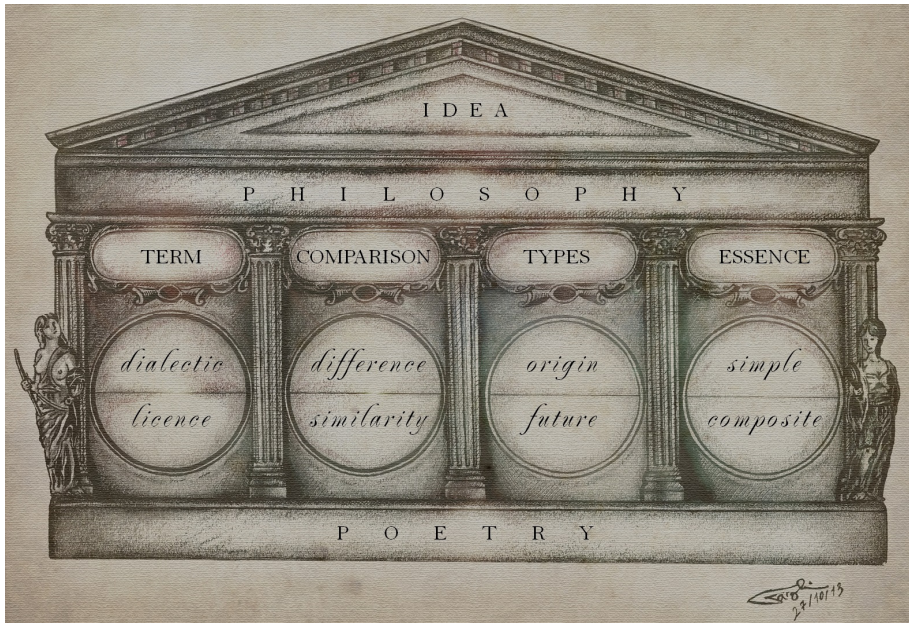


Fig. 3. The battle between philosophy and poetry

In general, the concept unifies philosophical with poetical concepts. This unification is used due to the following reason: the theory of *Disegno* was strongly influenced by philosophical and poetical concepts. The function of philosophy was according to Ficino to analyze the *'principles of all things'* and to find the *'Ideas'* they are based upon [15]. He concludes that philosophy could lead to a *'Golden Age'*. Like philosophy, poetry had the power to create an *'ideal world'*. It was praised as a divine art and through poetic frenzy or inspiration, an artist could create divine things. Moreover, according to Salutati, poetry can turn all things into *'something else'* [10]. He does not only see poetry in words, but in actions and objects as well. As shown in the Figure above, the philosophical and poetical concepts are presented in a dichotomous structure and are composed of four parts of investigation. The reason for this structure is the following: During the Renaissance, *'creative competitions'* or *'scientific battles'* lead to positive changes and thus to a progression towards perfection. Therefore, we build a *'scientific arena'* where philosophical and poetical concepts battle each other according to the parts of investigation. The parts will be described shortly by the following list:

1. **Term:** According to Epicurean philosophy, all scientific works should begin with a *'terminological'* analysis. Words should correspond to the used concepts. Based on Plato and Neoplatonic sources, *'dialectic'* is the art of speech and the ability to speak clearly about all concepts [19]. It seeks to define *'what'* a thing is. [19] [17]. On the other hand, the poetic *'licence'* has the power to free the researcher from clear concepts and terms by using poetic techniques such as metaphors or

- periphrases. It aims to encourage creativity and imagination of the researcher for forming '*something new*'.
2. **Comparison:** '*Comparison*' is a powerful concept for both philosophy and poetry. While philosophy uses this concept mostly for defining the '*different*' qualities of things, poetry focuses on '*similarities*'. According to Salutati, poetry is a science that searches especially for similitudes between things [20].
 3. **Types:** A main step to understand the nature of a thing is to analyze their types. Investigating the '*original*' types and principles of a thing is mainly a subject of philosophy. Poetry, however, focuses on potentiality and thus dreams on a potential '*future*' [4].
 4. **Essence:** Finally, the last part of investigation focuses on the essence of a thing. According to Neoplatonic philosophy, the essential form of a thing can be '*simple*' or '*composite*'. While the simple form is, according to Plotinus, always uncompounded, the composite one is a composition of different '*Ideas*'. The aim of the philosophical concept is to '*simplify*' the form of a thing according to its essential nature. In contrast to this, the poetical concept seeks to '*compound*' additional characteristics to the essential form and thus to build something new. This can be achieved by using poetical techniques such as '*epithets*'.

5 Designing the Ideal Form of Cars

The year 1885 is often considered as the birth of the automobile. In this year, the German engineer Karl Benz invented the first '*horseless carriage*' – the modern automobile. But interestingly, the '*Idea*' of a self-propelled car was formulated for the first time in the 13th century by the English philosopher Roger Bacon. In his letter '*De mirabile potestate artis et natura*' ('On the Marvelous Power of Art and Nature'), he wrote the following: "*It is possible that a car shall be made which will move with inestimable speed, and the motion will be without the help of any living creature*" [7, p. 26]. Moreover, the Renaissance scholars Giovanni Fontana and Leonardo da Vinci were the first to design this idea. About 1420, Fontana drew a self-propelled vehicle in his technological treatise '*Bellicorum instrumentorum liber*' ('Book on the instruments of war'). Leonardo da Vinci's self-propelled car was drawn around the year 1478 and can be found in his '*Codice Atlantico*' ('Atlantic Codex'). During the Renaissance period, as Filarete pointed out, design ('*Disegno*') gave birth to an '*Idea*' and thus it is not necessary to build own inventions. For this reason, most of the inventions of that time remained, unfortunately, on paper. However, according to this thinking, it can be said that the self-propelled car is the invention of the Renaissance.

To test our concept, we searched for a subject that is both relevant today and that was also in the focus during the Renaissance period. Hence, we selected the design subject '*the ideal form of cars*'. To design an ideal form of an object, the Renaissance scholars used a fascinating methodology: they draw an analogy of the analyzed object with '*the most perfect being*' - the humans. For them, man is, due to his likeness and image of God, perfectly designed. Surely, they were inspired by the ancient authors

Cicero and Vitruvius. Cicero wrote in his treatise ‘*De Natura Deorum*’ (‘On the Nature of the Gods’) that man is perfect, not only because of his intellect, but also for his body: “*What composition of limbs, what conformation of lineaments, what form, what aspect, can be more beautiful than the human? Each member is formed, not only for convenience but also for beauty*” [12, p. 12]. For Vitruvius, the form of a building should have “*an exact system of correspondence to the likeness of a well-formed human being*” [22, p. 47]. Mainly in architecture, the Renaissance scholars Filarete and Vasari described the ideal form of a city or palace by comparing it with the human being [6][21]. Hence, in our study, we built the same analogy. The paper presents some of the result of our analysis that dealt with the human body in particular. Moreover, the form of our study is ‘*Renaissance*’ based and is mainly inspired by the studies and drawings of Leonardo da Vinci and Francesco di Giorgio Martini. The following subsections describe the results of the investigation parts ‘*term*’ and ‘*comparison*’.

5.1 The Results of the Investigation Part ‘*Term*’

Etymologically, the term ‘*car*’ is derived from the Latin word ‘*currus*’ or ‘*carrum*’ and means a ‘*wheeled vehicle*’. In the ancient time, ‘*currus*’ was a chariot, mainly used in racing or for battles and its main purpose was speed traveling. Generally, for describing the concept of ‘*currus*’, we need two other terms: ‘*animals*’ and ‘*driver*’: the ‘*currus*’ was designed to be pulled by ‘*animals*’, especially by horses, and the ‘*driver*’ was responsible for the controlling of it movement. Francis Bacon also used the Latin term ‘*currus*’, but changed, as written above, the ‘*Idea*’ of it. The term that correspondence with his ‘*Idea*’ is ‘*automobile*’. The word ‘*automobile*’ is etymologically a hybrid word, a combination of the Ancient Greek term ‘*αὐτός*’ (‘*autós*’, ‘*self*’) and the Latin ‘*mobilis*’ (‘*movable*’), and means literally ‘*moved of itself*’. Therefore, a ‘*car*’ is a ‘*wheeled vehicle*’ that ‘*moves of itself*’, that means ‘*without the help of any living creature*’ and is controlled by a ‘*driver*’.

For the poetic concept ‘*licence*’, we used the following metaphor: the driver ‘is the Soul of a Car’. This metaphor is mainly inspired by Aristotle’s book ‘*De Anima*’ (‘*On the Soul*’). In his book, Aristotle argued that the soul is on the one hand the ‘*mover of the body*’ and on the other, due to its location in body, ‘*moved by the body*’. For this reason, we draw an analogy between ‘*soul*’ and ‘*driver*’. Like the philosophers debates on the ‘*seat*’ of the soul, we analyzed therefore the seat of the ‘*driver*’. Mostly, as also visualized in Figure 4, the ancient philosophers believed that the seat of the soul is either in the ‘*heart*’ or in the ‘*head*’³. Very roughly, we can say that the actual seat of the driver in a car is comparable with the position of the heart in human body. But to see the seat of the driver in the ‘*head*’, helps to create new ‘*Ideas*’ for a car. According to Plato, the head is ‘*the most divine part*’ of the human body. For Pacioli, the head is set to the top of the human body to be their ‘*guardian*’. As depicted in Figure 4, the head of the woman moves independently from her body. Hence, like a ‘*guardian*’, she is able to oversee the street without changing the position of her body.

³ More concretely, the brain is recognized to be the seat of the soul.

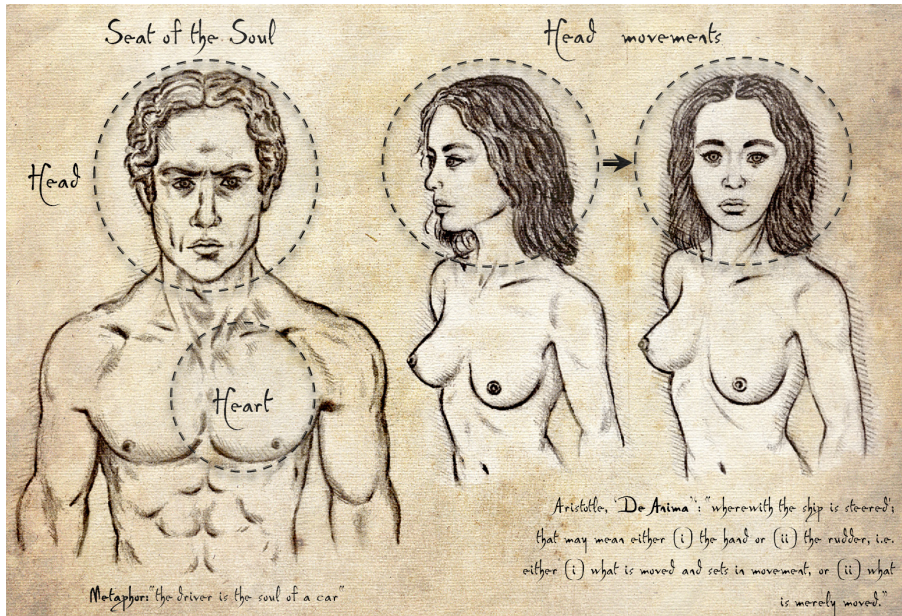


Fig. 4. Study on head movement

Subsequently, we analyze the connection between 'soul' and 'movement'. Interestingly, like the 'Idea' of automobile, the soul is characterized in Platonic and Neoplatonic sources as 'self-moving'. Based on Ficino's book *Theologia platonica* ('Platonic Theology'), the soul moves perfectly that means in 'circular motion' [16]. Hence, the 'circular motion' was considered as the ideal form of movement. According to the results of this investigation part, the 'Idea' is to add a 'moveable head' to the form of cars that can move in 'circular motion' and hence to differentiate between 'head' and 'body movements'. With this 'Idea', backward-driving with poor visibility could become a 'problem of the past'.

5.2 The Results of the Investigation Part 'Comparison'

Consequently, while the investigation part 'term' analyzed the head movements, the part 'Comparison' focuses on the movements of the body. It compares the movement system of the human body with that of a car. The Renaissance scholar who wrote about body movements was Leon Battista Alberti. In his treatise on Painting, he argued that the painter should study particularly the body movements that are "generated only [...] when the position changes" [1]. Inspired by the ancient orator Quintilian, he described the different directions of movement that change the position of the body. Basically, as shown in Figure 5, the following direction can be differentiated from each other: (A) vertical {up, down}; (B) horizontal or lateral {left, right}; (C) circular and (D) diagonal {up/left, up/right, down/right, down/left}. If we compare the movements of human and car, we recognize that the human can move in all basic directions (A, B, C, D). The car, however, moves only in the directions of A and C.

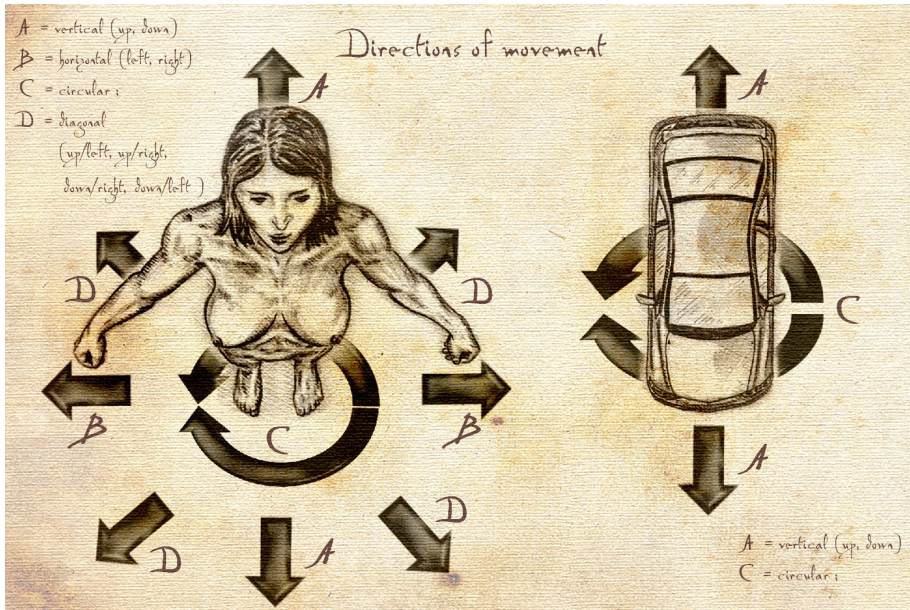


Fig. 5. Directions of movement

Hence, the 'differences' between the movement system of human and car lie in the 'diagonal' and 'lateral movements'. An 'ideal' vehicle motion system should be able to move in all directions. For this reason, the 'Idea' of this investigation part is to add the 'diagonal' and 'lateral movement' to the motion system of a car. With the 'Idea' of diagonal movement, a car could change the lane without rotating its body. The 'lateral movements' can change especially the behavior of parallel or sideway parking. With this 'Idea', the driver is able to park easily even in the narrowest gaps.

6 Conclusion

In summary, the aim of the paper was to find out what were the peculiarities of the original design theory 'Disegno' and what was the 'Idea' behind it. Therefore, we first analyzed significant works from the Classical Antiquity and Renaissance. Then, based on our analysis, we proposed an investigation concept that focuses on analyzing the 'Idea' of thing. Finally, we tested the investigation parts 'term' and 'comparison' of our proposed concept by analyzing the 'ideal form of cars'.

References

1. Alberti, L.B.: De Pictura, 1435, translated by Spencer, J. R., On Painting. Yale University Press, New Haven (1967)
2. Alberti, L.B.: De re aedificatoria, 1452, translated by Rykwert, J., On the Art of Building in Ten Books. MIT Press, Cambridge (1988)

3. Aristotle. *The Metaphysics of Aristotle*, 350 BC, Translated by M'Mahon, J.H., Bohn, H.G., York Street, Covent Garden, London (1857)
4. Aristotle. *Poetics*, 335 BC, Translated by Bywater, I. Dodo Press, Boston (2006)
5. Aristotle. *Politics*, 350 BC, Translated by Gillies, J., *Aristotle's Ethics and Politics*, comprising his practical philosophy. T. Cadell and W. Davies, London (1813)
6. Averlino, A. (Filarete), *Trattato d'architettura*, 1464, Translated by Spencer, J.R., *Treatise on Architecture*. Yale University Press, New Haven (1965)
7. Bacon, R.: *De mirabile potestate artis et natura*, 1214–1294, Translated by Davis, T. L. Chemical Publishing Company, Easton (1923)
8. Burckhardt, J.: *Die Kultur der Renaissance in Italien*. Phaidon Verlag, Wien (1930)
9. Castiglione, B.: *The Book of the Courtier from the Italian of Count Baldassare Castiglione*, 1528, Translated by Sir Hobby, D. Nutt (1900)
10. Cennini, C.: *Il libro dell'arte*, 1400, translated by Thompson, D.V., *The Craftsman's Handbook*. Dover Publications, New York (1965)
11. Cicero, M. T., *de Oratore*, 55 BC, Translated or Edited by J.S. Watson, *On Oratory and Orators*. Southern Illinois University Press, Carbondale (1970)
12. Cicero, M. T., *De Natura Deorum*, 45 BC, Translated by Walsh, P.G., *The Nature of the Gods*, Digireads.com Publishing, Stilwell (2007)
13. Faroughi, A., Faroughi, R.: *On the Poetry of Design*. In: Marcus, A. (ed.) *DUXU/HCI* 2013, Part I. LNCS, vol. 8012, pp. 38–47. Springer, Heidelberg (2013)
14. Faroughi, A., Faroughi, R.: *Über die Synthese der MCI basierend auf dem Ursprung des Designs*. In: Reiterer, H., Deussen, O. (eds.) *Mensch & Computer 2012: interaktiv informiert – allgegenwärtig und allumfassend!?*, pp. 213–222. Oldenbourg Verlag, München (2012)
15. Ficino, M.: *Commentaries on Plato's Republic, Laws and Epinomis*, 1496, Translated by Farnell, A., *When Philosophers Rule*. Shephard-Walwyn, London (2009)
16. Ficino, M.: *Theologia Platonica*, 1482, Translated by Allen, J.B., *Platonic Theology*, Cambridge. I Tatti Renaissance Library, vol. 2 (2002)
17. Mirandola, G.P.: (1486). *De hominis dignitate*, Translated by Von der Gönna, G. *Rede über die Würde des Menschen*, Reclam (1997)
18. Pliny the Elder, *Naturalis historia*, 77-79, Translated by Bostock, J., Riley, H.T. *The Natural History of Pliny*. Henry G. Bohn, London (1857)
19. Plotinus, E.: 270, Translated by MacKenna, S., Page, B.S., *The Six Enneads of Plotinus*, Philip Lee Warner, London (1917)
20. Salutati, C.: *De laboribus Herculis*, 1406, vol. 1. Translated by Ullman, B.L. (eds.) *In aedibus Thesauri mundi* (1951)
21. Vasari, G.: *Le vite dei più eccellenti architetti, pittori et scultori italiani*, 1568, Translated by Brown, B.B. et al, *Vasari on Technique*. Dover Publications, New York (1960)
22. Vitruvius, P.: *De Architectura libri decem*, 22 BC, *Vitruvius: The Ten Books On Architecture*. Echo Lib., UK (2008)
23. Zuccari, F.: *L'Idée de Pittori Scultori Ed Architetti*, 1607, In: Heikamp, D. (edt), *Scritti d'arte di Frederico. Zuccaro*, Florence (1961)