The 14th International Conference on Virtual Learning
VIRTUAL LEARNING – VIRTUAL REALITY

Phase II - Period 2010-2020: e-Skills for the 21st Century
Phase III - Period 2020-2030: Intelligence Learning –
Knowledge Society and Learning Culture

www.icvl.eu | www.cniv.ro
The ICV and CNIV projects supports Digital Agenda-Europe 2020

ISSN: 1844-8933 - ISI Proceedings, accessed via Web of Science, since year 2006

THOMSON REUTERS

ICVL 2019 dedicated to The Institute of Atomic Physics (IFA) - 70 years, Magurele, where the first Romanian electronic computer CIFA-1

ROMÂNIA
1918-2018 | SĂRBĂTORIM ÎMPREUNĂ

ICVL and CNIV Coordinator: PhD. Marin Vlada, University of Bucharest

---

The printing of Proceedings was sponsored by the Romanian Ministry of Research and Innovation, EUROPE - ROMANIA

Proceedings of the 14th International Conference On Virtual Learning

OCTOBER 25-26, 2019, UNIVERSITY OF BUCHAREST

MODELS & METHODOLOGIES, TECHNOLOGIES, SOFTWARE SOLUTIONS

Phase II - Period 2010-2020: e-Skills for the 21st Century

editura universității din bucurești

ICVL and CNIV Partners: Grigore Albeanu, Mircea Popovici, Radu Jugureanu, Adrian Adăscăliței, Olimpius Istrate

www.icvl.eu www.cniv.ro

ISSN: 1844-8933 - ISI Proceedings,
accessed via Web of Science, since year 2006

Şos. Panduri, nr. 90-92, BUCUREŞTI – 050663; Tel.Fax: 021 410.23.84
E-mail: editura@unibuc.ro, Web: www.editura.unibuc.ro

Desktop publishing: Meri Pogonariu

Conference Organisation

- General Chair **Dr. Marin Vlada**, Professor of Computer Science, University of Bucharest, Research Center for Computer Science (Romania)

- Technical Programme Chair **Dr. Grigore Albeanu**, Professor of Computer Science, Spiru Haret University, Research Center for Mathematics and Informatics (Romania)

- Associate General Chair **Dr. Dorin Mircea Popovici**, Professor of Computer Science, Ovidius University of Constanta (Romania), CERV- European Center for Virtual Reality (France)

- Associate General Chair **Prof. Radu Jugureanu**, eContent Department Manager, eLearning and eTraining Senior Consultant, Bucharest, Romania

- Associate General Chair **Dr. Adrian Adăscăliţei**, Professor at Technical University "Gh. Asachi" of Iasi, Romania

- Associate General Chair **Dr. Olimpius Istrate**, Prof. at University of Bucharest, Faculty of Psychology and Educational Sciences, Romania

Scientific Committee/Technical Programme Committee / Executive reviewers

Dr. Grigore Albeanu	Professor of Computer Science, Spiru Haret University, Research Center for Mathematics and Informatics, Romania
Dr. Adrian Adascalitei	Professor of Electrical Engineering Fundamentals, Technical University "Gh. Asachi", Faculty of Electrical Engineering, Iasi, Romania
Dr. Michael E. Auer	Professor of Electrical Engineering, Carinthia University of Applied Sciences, School of Systems Engineering, Villach, Austria General Chair, ICL – Interactive Computer aided Learning, http://www.icl-conference.org/
Dr. Angelos Amditis	Research Associate Professor (INTUITION Coordinator, http://www.intuition-eunetwork.net/), Institute of Communication and Computer Systems, ICCS- NTUA Microwaves and Optics Lab, ATHENS, GREECE
Dr. Rareş Boian	Professor of Computer Science (Virtual Reality), Mathematics and Computer Science, "Babes-Bolyai" University of Cluj-Napoca, Romania, http://www.ubbcluj.ro
Dr. Grigore Burdea	Professor of Applied Science (Robotics), Rutgers – The State University of New Jersey, Director, Human-Machine Interface Laboratory, CAIP Center, USA
Dr. Pierre Chevaillier	LISYC – Laboratoire d'Informatique des Systèmes Complexes, CERV – Centre Européen de Réalité Virtuelle (European Center for Virtual Reality), France, *European INTUITION Consortium member*
Dr. Mirabelle D' Cruz	Virtual Reality Applications Research Team (VIRART), School of Mechanical, Materials and Manufacturing Engineering (M3),University of Nottingham University, U.K., *European INTUITION Consortium member*
Dr. Steve Cunningham	Noyce Visiting Professor of Computer Science, Grinnell College, Grinnell, Iowa, USA Department of Computer Science
Dr. Ioan Dzitac	Professor of Computer Science, Executive Editor of IJCCC, Agora University,Oradea, Romania
Dr. Victor Felea	Professor of Computer Science, "Al.I. Cuza" University of Iasi, Faculty of Computer Science, Romania
Dr. Horia Georgescu	Professor of Computer Science University of Bucharest, Faculty of Mathematics and Computer Science, Romania
Dr. Radu Gramatovici	Professor of Computer Science University of Bucharest, Faculty of Mathematics and Computer Science, Romania
Dr. Felix Hamza-Lup	Professor of Computer Science at Armstrong Atlantic State University, USA

Dr. Angela Ionita	Romanian Academy, Institute for Artificial Intelligence (RACAI), Deputy Director, Romania
Dr. Olimpius Istrate	University of Bucharest, Faculty of Psychology and Educational Sciences, Bucharest, Romania *www.elearning.ro*
Prof. Radu Jugureanu	AeL eContent Department Manager, SIVECO Romania SA, Bucharest, Romania *www.siveco.ro*
Dr. Bogdan Logofatu	Professor at University of Buchares, Faculty of Psychology and Educational Sciences, Bucharest, Romania *www.unibuc.ro*
Dr. Jean-Pierre Gerval	ISEN Brest (école d'ingénieurs généralistes des hautes technologies), France, *European INTUITION Consortium member*
Dr. Daniel Mellet-d'Huart	AFPA Direction de l'Ingénierie Unité Veille sur la Réalité Virtuelle MONTREUIL, *European INTUITION Consortium member*
Dr. Marius Măruşteri	Professor in the Department of Informatics, University of Medicine and Pharmacy Târgu - Mureş, Romania
Dr. Mihaela Oprea	Professor in the Department of Informatics, University of Ploiesti, Romania
Thomas Osburg	Intel Education Manager, Europe *www.intel.com/education*
Dr. Harshada (Ash) Patel	Virtual Reality Applications Research Team (VIRART)/Human Factors Group Innovative Technology Research Centre, School of Mechanical, Materials and Manufacturing Engineering, University of Nottingham, University Park, Nottingham, U.K., *European INTUITION Consortium member*
Dr. Dana Petcu	Professor at Computer Science Department of Western University of Timisoara, Director at Institute e-Austria Timisoara, Romania
Dr. Dorin Mircea Popovici	Professor of Computer Science, Ovidius University of Constanta, Romania / CERV– European Center for Virtual Reality (France, *European INTUITION Consortium member*)
Dr. Ion Roceanu	Professor of Computer Science, Director of the Advanced Distributed Learning Department, "Carol I" National Defence University, Bucharest, Romania
Dr. Maria Roussou	Virtual Environments and Computer Graphics Lab., Department of Computer Science, University College London, U.K., *European INTUITION Consortium member*
Dr. Ronan Querrec	CERV – Centre Européen de Réalité Virtuelle (European Center for Virtual Reality), Laboratoire d'Informatique des Systèmes Complexes, France
Dr. Luca-Dan Serbanati	Professor of Computer Science, University "Politehnica" of Bucharest, Romania and Professor at the "La Sapienza" University, Italy, *European INTUITION Consortium member*
Dr. Leon Tambulea	Professor of Computer Science, "Babes-Bolyai" University, Cluj-Napoca, Romania

Dr. Jacques Tisseau	CERV – Centre Européen de Réalité Virtuelle (European Center for Virtual Reality), LISYC – Laboratoire d'Informatique des Systèmes Complexes, France, *European INTUITION Consortium member*
Dr. Alexandru Tugui	Professor at "Al. I. Cuza" University of Iasi, FEAA, "Al. I. Cuza" University Iasi, Romania
Dr. Marin Vlada	Professor of Computer Science, University of Bucharest, Romania, *European INTUITION Consortium member*

Research papers – Major Topics

The papers describing advances in the theory and practice of Virtual Environments for Education and Training (VEL&T), Virtual Reality (VR), Virtual Laboratory (VirtLab), Information and Knowledge Processing (I&KP), as well as practical results and original applications. The education category includes both the use of Web Technologies, Computer Graphics (CG) and Virtual Reality Applications, New tools, methods, pedagogy and psychology, Case studies of Web Technologies and Streaming Multimedia Applications in Education, experience in preparation of courseware.

Thematic Areas / Sections

- **MODELS & METHODOLOGIES (M&M)**
- **TECHNOLOGIES & VIRTUAL LABORATORY (TECH)**
- **SOFTWARE SOLUTIONS (SOFT)**
- **"Intel® Education" – Innovation in Education and Research (IntelEdu)**

Objectives

2010 – Towards a Learning and Knowledge Society – 2030

Phase II - **Period 2010-2020**: e-Skills for the 21st Century
Phase III - **Period 2020-2030**: Intelligence Learning –
Knowledge Society and Learning Culture

Relevant topics include but are not restricted to:

- National Policies and Strategies on Virtual Learning
- National Projects on Virtual Universities
- International Projects and International Collaboration on Web-based Education
- Dot-com Educational Institutions and their Impact on Traditional Universities
- Educational Portals for education and training
- Reusable Learning Objects for e-Learning and e-Training
- Testing and Assessment Issues of Web-based Education
- Academia/Industry Collaboration on Web-based Training
- Faculty Development on Web-based Education

Specific Opportunities for Visualization a Reason for Modern Interior Design Education

Katerina Despot[1], Vaska Sandeva[1], Miroslav Vasilev[2]

(1) Goce Delcev University,
Krste Misirkov b.b. P.O. Box 201 Stip 2000, R. N. Macedonia,
e-mail: vaska.sandeva[at]ugd.edu.mk
(2) Trakia University, faculty of Technics and technologies,
38 Graf Ignatiev str., 8602, Yambol, Bulgaria,
e-mail:miro8611[at]abv.bg

Abstract

The design of furniture today is as important as the spatial planning of an object, its structure, materials and walls. This condition is due to the fact that contemporary architecture truly reflects the life habits and social organization of today. The activity of modern design is enriched with new features and tasks that lead to its differentiation, and from there, we notice changes in the theory and practice of design education. The type of seating position is a challenge for analysis and processing, as well as studying seating positions for different purposes depending on the specific seating position and the need for how long it is used. The review is based on the design of chairs in the symphony orchestra as a specific way of sitting for performing a certain work activity.

Key words: Design education, Chair position, Ergonomics, Interior

1 Introduction

The authors Kok et al. (2016) recommends focusing only on factors that are risky when problems arise during playing, due to the fact that there is little room for variation in the movement of the body while playing. The factors that would take into account are the repertoire of the musician or the conditions in which the action takes place.

The conditions in which the musician performs the repertoire is the piece of furniture-chair on which he sits while playing the instrument. In this context, the ergonomic factor of the chair should be taken in relation to the musician-construction of the chair and the quality of the surface of the seat (Despot et al., 2017; Zlatev et al., 2019).

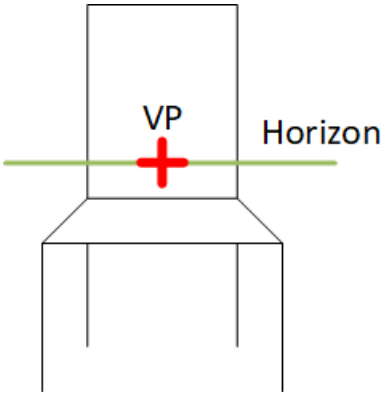

Figure 1. Chair with one point perspective, horizon and vanishing point (VP)

We can only assume how many types of chairs exist, approximately as much as the number of different people. The chair as an object is available to everyone, exists in various forms that are transformed depending on the material, it can be simple in its concept or with a different meaning. The base form consists of a horizontal surface at a standard distance from the floor intended to support the body while sitting, the vertical surface is set to support the back (Figure 1).

Besides the basic elements, the chair consists of many more elements. The psychological connecti

with the user (Steinmetz et al., 2015; Indrie et al., 2017), which is stronger than with any other furniture, can be a symbol of status and belief.

The authors Fiell et al. (1993) write that the success of a chair is measured by the designer's synthesis of aesthetics and function while meeting certain needs. Designer George Nelson argues that the shape of the chair consists of three factors: function, aesthetics and material.

2 Materials and Methods

This paper covers extensive analysis and research on the sedentary position, the characteristics and problems that man faces every day at different seating positions.

The problems that arises from long hours of sitting in a specific working position (Litchfield, 1893; Nelson, 1994; Gibbs, 2005). Through ergonomic analyses and various tests, data are obtained for the ideal seating positions of pre-defined positions, backed up by the construction and selection of materials that facilitate the seating and workload of a person during a job position.

The design activity is enriched with new features and tasks that lead to its differentiation, and from there, we notice changes in the theory and practice of design. Expanding the range of contemporary design is realized not only through the line of enriching the content, but also thanks to the growing uninterrupted information links between different needs - social, economic, cultural or contemporary design extends the territorial scope and scope of its application.

3 Results and Discussion

In recent decades, the interest in the magnitude of the human body and dimension as a critical factor in the design has grown. This interest is greatest in the field of engineering (Zlatev, 2016)and education, including contemporary learning tools (Dineva et al., 2011; Nedeva et al., 2013; Shivacheva et al., 2016) that deals with the human factor or as it is called in Europe ergonomics.

Age is another important factor in the size of the body. The human body reaches its highest growth in teenage years and the early twenties, while reduction in growth in both sexes occurs with aging.

Although attempts have been made to standardize anthropometric measures in terms of definitions and terminology, the interpretation and significance of the recorded data is often complicated. Architects and industrial designers must bear in mind that the same factors that make up anthropometry complex and monotonous require serious access to the application of its data.

The seating dynamics can be more clearly illustrated by studying the mechanics of the carrier system and the structure of the bones in the human body. According to *Tichauer*: "The torso support axis is a line that passes through the lowest point of the pelvis on the surface of the seat."

Marcuse (1975) disorders associated with musical performance are a problem for professional musicians.

Given the numerous consequences that musicians have in using musical instruments, these consequences can be considered a threat to their professional activity. In this issue, musicians of wire instruments are considered as a target group. Defects in the upper body position when playing the instrument, causing ergonomic static back pressure and non-ergonomic movements, are the main cause of musculoskeletal disorders and pain syndromes commonly occurring in the spinal column.

Literature related to seating comfort (Nikol et al. 1993; Sembach et al., 2002; Sousa et al., 2016) states that seat pressure is a basic measure that is associated with the user's comfort when sitting. One of the studies to be noted is carried out by three authors from the University of Naples based on the data carried out on the basis of the measurement. This study analyses the seating comfort test during experiments involving 22 volunteers and 4 different chairs. Research in the field of medicine has shown that in recent decades back pain in the population has increased due to

sedentary lifestyle as a result of the long period of sitting.More than 60% of people have at least one type of back pain during the working period. Ergonomic solutions of stools are taken as a preventive solution. The purpose of their study was to explore the biomechanical aspects of ergonomic office chairs as a benchmark for further designers to improve human health.

Specialized literature does not recognize the definition of comfort, but in recent years there are assumptions that comfort and discomfort are two different things.

The comfort is based on subjective analysis and analysis of the position of the body while the discounter is an objective analysis of the acquired problems.

Ergonomics of music chairs: This study consists of 40 examinees-musicians all at different levels (professionals, amateurs and students) and 6 different music chairs with different ergonomic features.

The differences that occur between the chairs are mainly related to the distribution of the pressure along the seating surface. Playing an instrument adds extra force to the surface of the chair, greater than the weight of the instrument. When playing one instrument, the body adapts to fast, repetitive, asymmetrical, complicated movements of hands and fingers. In order to support these movements, the torso simultaneously performs static work. These combined movements of dynamic and static muscular work in the respective parts of the body are accumulated by increasing the level of performance in terms of intensity, density, duration, degree, occurrence and frequency of movement. Additional loads on the motion systems are associated with instrument-specific performance, and in the worst case, it can cause overload. This can lead to symptoms such as pain in the chin, back, neck, shoulder and arms.

These symptoms that occur when playing certain instruments are most commonly associated with musculoskeletal disorders, and are therefore referred to most frequently and are analyzed in this paper in order to confirm the given hypotheses. These disorders emerge among professional musicians, students, as well as amateur musicians, concluded by various research carried out by several authors. By analyzing the previously conducted research it can be concluded that taking a position typical of playing a particular instrument causes an unfavorable position of the body. The effects of playing different regions of the musculoskeletal system have so far been observed in many cases using different measurement techniques highlighted by various authors.

In order to compare the different ergonomic concepts of the chairs with respect to the musical position, the distribution of the seating pressure is just as important as the upper part of the body, which must be assumed to be adjusted to the pelvic position during sitting. Whether the different concepts of music chairs depending on the position of playing compared to the usual seating position have different effects on these aspects is the subject of this study. Various researches on a wide range of musicians have been made to determine whether the level of professionalism, experience or the way of playing play a role in sitting. Through this analysis, two hypotheses are identified: Hypothesis 1: The geometry of the chair affects the sitting position.Hypothesis 2: The sitting position depends on the professional level of the musician.

Ergonomic movements and positions are a necessary condition for continuous instrumental performance. The economic in this context means that the musician applies minimal physical effort to maintain the position of the body and the movements. Musculoskeletal discomfort usually generates a desire to avoid certain pain. The musician is forced to try out alternative positions of the body using additional muscles, leading to deviation from the necessary direction of movement that can impair performance. The occurrence of musculoskeletal dysfunction is generally reflected early in the unhealthy holding of the body.

After considering all aspects of problems in the specific seating positions of the musicians of wire instruments that are still included in the category of specific positions of the long-term sitting, design concepts should be made which will be used by the musicians, which would facilitate their working pose.

The design of chairs for the specific seating positions is primarily limited by pure functionality, where particular attention is placed on the horizontal and vertical structural connection of the chair and its choice of material, also the main emphasis should be placed in the part of the backrest where it should be supported by the third vertebrae on the spinal column, which would ensure the safety of the sitting position in a long-term performance with the upper part of the body, as presented on Figure 2. The choice of the upholstery material to be made of intelligent textile that would avoid sweating and contribute to sedentary incompetence, it enters the category of modern design that we cannot skip and the changes that prompt in this field the rapid development of technology and technology, and possibilities of production.

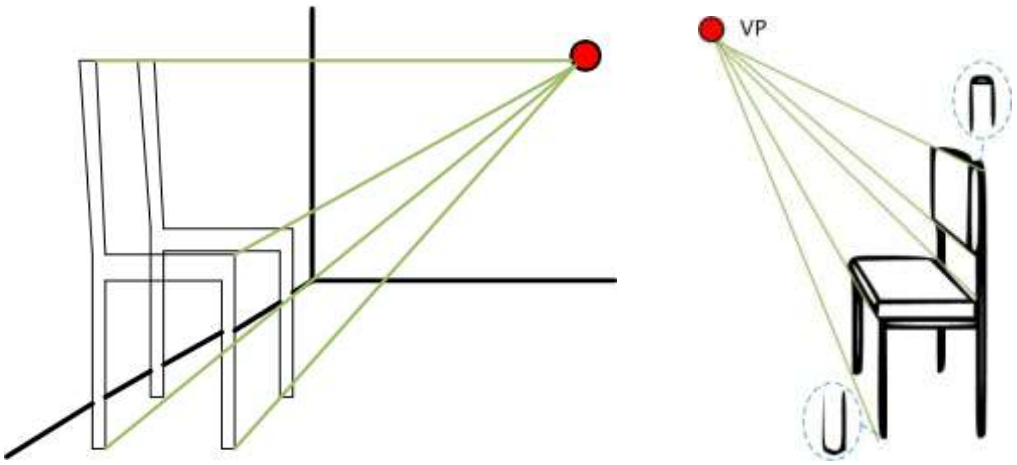

Figure 2. Chairs with their perspective and orthogonal

4 Conclusion

While musicians who play the instrument in a standing position can use the whole body, musicians in a sitting position cannot use their legs and knees to compensate for the asymmetric moves the body takes in playing. A good chair should be reimbursed to maintain the most favorable position of the body where the bulk of the weight is prevalent in the ischemic tuberculosis or bone for sitting.

A table designed for anthropometric dimensions does not necessarily mean that it is convenient. If the design does not correspond to the measures of the human body and the size of the body, then sitting will be uncomfortable.

Musicians should be aware of the prevention and equipment of orchestral musicians to be the best from an ergonomic point of view.

Knowledge of different types of stools that satisfy certain instrumental groups can contribute to the prevention of musculoskeletal disorders.

References

Despot, K., Sandeva, V., Namicheva, E. (2017): TimeLESS concepts of the sitting form-chairs. *International conference "Utopia and Future"*, Bulgaria. 2017.

Dineva, S., Stoikova, V. (2011): Application of Interactive Devices and Virtual lab in Chemistry Learning. *Proceedings of the 6th International conference on virtual learning* (ICVL), Romania, 261-267.

Fiell, C., Fiell, P. (1993): *Modern chairs*. Kèoln: Benedikt, Taschen, 1993.

Gibbs, J. (2005): *Dizajn enterijera*. Jenny Gibbs, Translator Daniela Ninković, Aleksandar Pavić. Srpsko izd. – Beograd, Don Vas.

Indrie, L, Kazlacheva, Z, Ilieva J., Gherghel, S. (2017): Embroidery-from digital designing to fine art. *Revista Industria Textilă*, 68, 5, 366-369.

Kok, L., Huisstede, B., Voorn, V., Schoones, J, Nelissen, R. (2016): The occurrence of musculoskeletal complaints among professional musicians: a systematic review. International archives of occupational and environmental health, 89, 3, 73-96.

Litchfield, F. (1893): Illustrated History of Furniture from the Earliest to the Present Time. Project Gutenberg's Illustrated History of Furniture.

Marcuse. S. (1975): *A survey of musical instruments*. David & Charles, Newton Abbot. 1975.

Nedeva, V., Dineva, S., (2013): Design and development of efficient e-learning courses. *Proceedings of the 11th International conference on virtual learning* (ICVL), Romania, 108-115.

Nelson, G. (1994): *Chairs*. New York: Acanthus Press.

Nicol, K, Rusteberg, D. (1993): Pressure distribution on mattresses. *J Biomech*, 26, 14, 79-86.

Sembach, K., Leuthauser, G., Gossel, P. (2002): *Twenthieth-Century furniture design*. Taschen.Koln. 2002.

Shivacheva, G., Nedeva, V. (2016): Methods for Teaching Programming Using Virtual Laboratory. *Proceedings of the 11th International conference on virtual learning* (ICVL), Romania, 92-98.

Sousa, C., Machado, J., Greten, H., Coimbra, D. (2016): Occupational diseases of professional orchestra musicians from northern Portugal: a descriptive study. *Medical Problems of Performing Artists*, 31, 1, 8-12.

Steinmetz, A., Scheffer, I., Esmer, E., Delank, K., Peroz, I. (2015): Frequency, severity and predictors of playing-related musculoskeletal pain in professional orchestral musicians in Germany. *Clinical Rheumatology*, 34, 9, 65-73.

Zlatev, Z. (2016): Integration of additional device to a multimedia presentation system. *Proceedings of 11th International Conference on Virtual Learning* (ICVL), Romania, 209-213.

Zlatev, Z., Indrie, L., Ilieva, J., Ivanova, T. (2019): Analysis on colors of folk costume and their application in contemporary textile design. *Annals of the university of Oradea Fascicle of textiles, leatherwork*, 20, 1, 125-130.