

Izvirni znanstveni članek *Original Scientific Paper*

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Določanje barve objektov v urbanem okolju s spektrometrijo

Determination of Object Colours in Urban Environments Using Spectroradiometry

Če želimo barvo objekta prilagoditi barvam v okolju, jih je treba opredeliti z natančno in objektivno metodo. Spektrometrija omogoča merjenje odbite svetlobe s površine objekta tudi na večjih razdaljah, pri tem pa ima pomembno vlogo izhodišče opazovanja. Zato je bil cilj raziskave ugotoviti, kako na rezultate meritev vpliva razdalja merjenja. Za analizo barv objektov v urbanem okolju smo uporabili spektrometrijo PR – 650 (Macbeth, ZDA). Meritve so bile izvedene ob različnih časih dneva v različnih vremenskih razmerah, pri čemer so bili zajeti objekti do višine štirih metrov. Izbrali smo 70 objektov in izvedli meritve z razdalje 10 oziroma 50 metrov. Rezultati meritev so bili zbrani kot refleksijski spektri opazovanih površin ter preračunani v koordinate barvnega prostora CIELAB. Rezultati so pokazali, da ni mogoče vnaprej definirati barve, ki bi imele identične karakteristike pri opazovanju z različnih razdalj. Zelo verjetno odstopanja nastanejo zaradi nehomogene površine objektov in zaradi manjših odstopanj v mestu zajema, barvne razlike ΔE^*_{ab} pa lahko znašajo celo do 40 enot. Raziskava je pokazala, da zaradi navedenih omejitev spektrometrija ni absolutno najboljša metoda za določanje barve objektov v okolici, s povečanjem števila meritev v različnih razmerah pa lahko pridobimo dovolj zanesljive in uporabne rezultate. Na podlagi rezultatov lahko povzamemo, da v urbanem okolju mesta Ljubljane prevladujejo nevtralne barve različnih stopenj svetlosti.

Ključne besede: spektrometrija, barve urbanega okolja, barvni prostor CIELAB, barvne razlike

To adjust the colour of an object to the colours in an environment, it is necessary to define a precise and objective method. Spectroradiometry enables the measuring of reflected light from the surface of an object at larger distances, where the important role is that of the baseline observation. The aim of this study was thus to determine how the distance of the measurement affects the measurement results. To analyse the colours of buildings in the urban environment, we used a spectrometrija PR-650 (Macbeth, USA). The measurements were performed at different times of the day in various weather conditions and the objects up to 4 m in height were covered. We selected 70 objects and measured them from the distance of 10 m and 50 m. The measurement results were collected as reflection spectra of the observed

*surface and recalculated into the CIELAB colour space coordinates. The results showed that it is not possible to define in advance a colour which would have identical characteristics as seen from various distances. Very likely, deviations occur due to inhomogeneous surface structures and for minor variations in cover, the colour differences ΔE^*_{ab} can be up to 40 units. The results showed that due to limitations, spectroradiometry does not represent the absolute best method for determining the colour of buildings in the area; however, by increasing the number of measurements in different conditions, sufficiently reliable and useful results can be obtained. Based on the results, it can be concluded that the urban area of Ljubljana is dominated by neutral colours of different brightness levels.*

Keywords: spectrometrija, urban environment colour, CIELAB colour space, colour difference

Strokovni članek *Professional Paper*

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ITMA 2011 – Integracija procesov predenja in pletenja

ITMA 2011 – Integration of Spinning and Knitting Processes

Svetovna razstava tekstilne strojegradnje ITMA 2011 je bila pomembna prireditev, kjer so bile postavljene na ogled številne tehnološke in strojne novosti na različnih področjih tekstilstva. V štirih letih od zadnje razstave so izdelovalci tekstilnih strojev postavili nove mejnike v tehnoloških dosežkih, produktivnosti in kakovosti dela tekstilnih strojev. Opazno je bilo upoštevanje strožjih ekoloških smernic, zato so novi stroji varčnejši pri porabi energije. Posebej revolucionarnih novosti pa tokrat ni bilo. Od prikazanih novosti si gotovo zasluži posebno pozornost integracija dveh tekstilnomehanskih procesov: predenja in pletenja. Povezava dveh tehnološko tako različnih procesov, kot sta predenje in pletenje, se zdi precej nenavadna, vendar po zagotovilih treh izdelovalcev krožnih pletilnikov, Mayer & Cie., Terrot in Pailung, zagotavlja velike prihranke pri prostoru, energiji, investicijskih stroških in stroških osebja. V članku so opisane tehnološke in strojne rešitve omenjenih treh izdelovalcev, ki orjejo na tem področju ledino, saj vidijo v novih strojnih rešitvah velik prodajni potencial. Njihov optimizem potrjuje veliko zanimanje obiskovalcev sejma za učinkovito integracijo procesov predenja in pletenja.

Ključne besede: ITMA 2011, integracija procesov predenja in pletenja, Mayer & Cie., Terrot, Pailung

The textile machinery exhibition ITMA 2011 was an important event, where the technological innovations and new machinery for a variety of textile applications were displayed. In the four years since the last exhibition of textile machinery, the manufacturers have set some new milestones in technological achievements, productivity and quality of work. The majority of producers have considered in their solutions stricter environmental guidelines; therefore, the new machines are more economical regarding the energy consumption. Particularly revolutionary innovations were not shown at ITMA 2011. However, one innovation deserves special attention, i.e. the integration of two textile processes, spinning and knitting. It seems rather unusual to make the integration of two so different technological processes. According to the assurances of three manufacturers of circular knitting machines, i.e. Mayer & Cie., Terrot and Pailung, the new combined technology provides huge savings in space, energy, capital costs and staff costs. The article describes the technology and machine solutions of the three manufacturers that break new ground in this area. All of them see a great sales potential in the new machine design solutions. Their optimism is confirmed by a strong interest of the visitors at the fair in the effective integration of the processes of spinning and knitting.

Keywords: ITMA 2011, spin to knit integration, Mayer & Cie., Terrot, Pailung

Strokovni članek Professional Paper

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ITMA 2011 – Pletilstvo: celovita evropska predstava za svetovno občinstvo *ITMA 2011 – Knitting: Complete European Show for Worldwide Public*

Na razstavi ITMA 2011 v Barceloni so se predstavile vse pletilske podpanoge: plosko in krožno votkovno pletenje, snutkovno pletenje, nogavičarstvo, izdelava pletilnih elementov in posebna oprema za šivanje pletiv. Na področju pletenja povečevanje vzorčnih možnosti, finosti pletilnikov, hitrosti pletenja, hitrosti menjav ter prilagodljivosti željam kupcev. Ob napovedi podražitev energije je posebna pozornost namenjena njeni zmanjšani porabi. Selitev proizvodnje na območja s poceni delovno silo je strojograditelje še bolj spodbudila k razvoju dveh glavnih skupin pletilnikov: po eni strani učinkovitih in ekonomičnih modelov, posebej namenjenih velikoserijsko proizvodnji, po drugi strani pa inovativnejših modelov za maloserijsko in ultraprilagodljivo proizvodnjo izdelkov visokega cenovnega razreda.

Tradicionalni izdelovalci pletilnikov pred novimi prednjačijo z usmeritvijo v trajnostni razvoj. Pletilstvo, ki je pred skoraj dvema desetletjema s pletenjem v celem združilo pletilski in konfekcijski proces, je z novimi pletilniki *spin-knit* združilo predilski in pletilski proces. Združevanje procesov, ne le procesnih faz, je nedvomno največja novost barcelonske razstave ITMA, ki jasno kaže smer razmišljanja: čim krajši čas in čim manjši prostor od surovine do končnega izdelka.

Ključne besede: ITMA'11, votkovno pletenje, snutkovno pletenje, brezšivno pletenje, pletilnik, novosti

All the knitting industry sub-sectors were presented at ITMA 2011 in Barcelona, namely the flat and circular weft knitting, warp knitting, hosiery, knitting elements production and special equipment for the knitted fabrics production. In the field of knitting, the increase in the patterning possibilities, finer gauge, knitting speed, expanding possibilities of quick changes in gauge and patterning, and adapting to consumers' requests has continued. Due to an expected increase in prices, special attention was paid to reduced energy consumption. The production shift to the areas with cheap labour has encouraged the machine producers even more than in the past to develop two major groups of knitting machines – efficient and economic models made especially for the mass production on the one hand and innovative designs for small batch and ultra-flexible manufacture of products for high price segment on the other. Traditional manufacturers of knitting machines have moved forward compared to the new ones by focusing on sustainable development. Two decades ago, two manufacturing processes, knitting and sewing, were replaced by whole garment and seamless all-in-one concepts. With the new spin-knit concept, the spinning and knitting processes were joined. Joining the whole processes not only the processing phases was undoubtedly the greatest novelty of ITMA Barcelona, which clearly showed the direction of thinking, i.e. the shortest time possible and the minimal space required for the manufacture from a raw material to a finished product.

Keywords: ITMA'11, weft knitting, warp knitting, seamless knitting, knitting machine, novelties

Strokovni članek Professional Paper

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Tkanje na Itmi 2011 *Weaving at ITMA 2011*

Na Itmi 2011 je bilo na področju tkanja (priprava za tkanje, tkanje in računalniško podprto vzorčenje) predstavljenih razmeroma

malo novosti pri izboljšanju tehnologije in povečanju proizvodnih hitrosti. Predstavljene izboljšave so se nanašale na prihranke pri energiji, izboljšanju kakovosti izdelkov in polizdelkov ter povečani skrbi za ekologijo. Na skoraj vseh področjih tkanja je prišlo do prevzemov podjetij in s tem do zmanjšanja konkurence na posameznih področjih. Zato je bilo pri marsikateri fazi proizvodnje tkanin opaziti zmanjšanje števila ponudnikov oziroma razstavljalcev opreme. Visoki stroški razstavljanja v Evropi brez velikih možnosti podjetij za prodajo, zaradi zapiranja ali zmanjšanja tekstilnih obratov, so prav tako pripomogli k zmanjšanju števila razstavljalcev. Pomembni novosti na področju tkanja je predstavilo podjetje Dornier, in sicer: 1. tkanje z odprtim grebenom, primerno za izdelavo tekstilij za interier (zavese z dodanimi nitmi v obliki vezenine) ter v tehnične namene (večaksialne tkanine), 2. elektronsko povezavo (imenovano »weave by wire«) med tkalskim strojem in žakarskim mehanizmom. Oba sinhrono delujeta brez mehanske povezave in skupnega pogona.

Ključne besede: ITMA 2011, novosti, priprava na tkanje, tkanje, pregled kakovosti.

At ITMA 2011, an exhibition in the field of weaving (weaving preparation, weaving and computer aided sampling), relatively few innovations in improving the technology and increasing production speed were presented. The presented innovations were related to energy savings, improving the quality of products as well as to the increased concern about ecology. In almost all fields of weaving, corporate mergers took place, consequently leading to reduced competition in the area. In many production stages of woven fabrics, a reduction of a number of exhibitors or equipment suppliers was observed. Moreover, high exhibiting costs without good prospects for sale, and closing and reducing textile plants also contributed to fewer exhibitors. Significant innovations in the field of weaving were presented by the Dornier weaving company, i.e. firstly, weaving with open reed, suitable for manufacturing textile for interior (curtains with added threads in the form of embroidery) and for technical purposes (multiaxial fabrics), and secondly, electronic connection during the weaving machine and jacquard mechanism, called »weave by wire«. They both work synchronously without any mechanical connection and common drive.

Keywords: ITMA 2011, novelties, weaving preparation, weaving, quality inspection

Strokovni članek *Professional Paper*

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ITMA 2011 – Digitalni tisk tekstilij naredil odločen korak naprej *ITMA 2011 – Digital Textile Printing Taking a Decisive Step Forward*

Tudi ob tokratni Itmi 2011 v Barceloni je bila razstavljena peštra paleta opreme, namenjene vsem tehnikam in tehnologijam tiskanja tekstilij. Predstavljene tehnološke rešitve ploskega, rotacijskega in transfernega tiskanja so bile usmerjene v energetske izboljšave in v zmanjšanje izpustov plinov in odpadnih voda. Digitalni brizgalni tisk se je z občutnim zvišanjem proizvodnih hitrosti povsem približal konvencionalnim tehnologijam tiskanja tekstilij.

Ključne besede: ITMA 2011, tiskanje tekstilij, digitalni tisk, tekstilni tiskalniki

At ITMA 2011, which was this time held in Barcelona, a variegated pallet of equipment designed for all textile printing techniques and technologies was exhibited. The presented technological solutions for flatbed and rotary screen printing, as well as transfer printing were oriented into energy improvements, and reduction of gas emissions and waste water. With a considerable increase in the production speed, the digital ink-jet textile printing draws nearer to the conventional textile printing technology.

Keywords: ITMA 2011, textile printing, digital printing, textile printers

Strokovni članek *Professional Paper*

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Vrednotenje in merjenje parametrov, definiranih v tehničnih specifikacijah *Evaluating and Measuring Parameters Defined in Technical Specifications*

Pri izbiri sestavnih delov uniforme se potencialni naročnik opira na tehnične parametre, ki jih sam definira in zapiše v tako imenovano tehnično specifikacijo. Na podlagi te ocenjuje kakovost ponujenih oblačil. Za potrebe čim bolj objektivne presoje o kakovosti materialov imajo pomembno vlogo tudi neodvisni testni laboratoriji. Eden teh je Laboratorij za obdelavo in preskušanje polimernih materialov (LOPPM), ki deluje v okviru Fakultete za strojništvo v Mariboru. V okviru LOPPM smo letos na 2. simpoziju o uniformah sodelovali s temo »Zakaj je pri pripravi nove celostne podobe uniformiranih oseb pomembno zahtevati natančno definirane parametre?«. Praksa namreč kaže, da je predvsem

pri potencialnih ponudnikih še vedno veliko nejasnosti pri interpretaciji določenih parametrov, zapisanih v tehnični specifikaciji, ki jo oblikuje potencialni naročnik. Zato sta v prispevku opis in razlaga najpomembnejših parametrov, za katere velja, da so stalnica različnih tehničnih specifikacij za potrebe uniform.

Ključne besede: uniforma, tehnična specifikacija, kakovostni parametri, testni laboratorij

When selecting components of uniforms, a potential customer relies on the technical parameters which are defined in the so-called technical specifications. Namely, on the basis of technical specifications, the quality of clothing is assessed. In as much as possible objective assessments concerning the quality of materials, independent testing laboratories play a very important role. One of such laboratories is »Laboratory for Characterization and Processing of Polymers (LCP)«, which operates within the framework of the Faculty of Mechanical Engineering in Maribor. In the context of LCP, we participated this year at the 2nd Symposium on Uniforms, with the theme »Why is it important to require well-defined parameters in the preparation of a new integrated image of uniformed persons?« It has been shown in practice that especially from the part of potential providers, a lot of ambiguity still exists in the interpretation of certain parameters in the technical specifications defined by a potential customer. Therefore, the article covers the description and explanation of the most important parameters usually present in different technical specifications in the requirements for uniforms.

Keywords: uniform, technical specification, quality parameters, testing laboratory

Strokovni članek *Professional Paper*

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Uniforme kot funkcionalno oblačilo z močjo komunikacije

Uniforms as Functional Garments with Communication Power

Uniforme nas posredno ali neposredno spremljajo na vsakem koraku, v različnih ustanovah in kompleksih, katerih osebje je

uniformirano v oblačila. V prispevku želimo poudariti vidike, ki sooblikujejo današnje pojmovanje oblačilnih sistemov uniform, sprejemanje uniformiranih ljudi v družbi in njihovo korelacijo z okoljem. Dandanes poznamo veliko različnih vrst uniform, ki jih uporabljajo oborožene sile, paravojaške organizacije, delovne organizacije, gostinski in hotelski kompleksi, društva in drugi. Splošna funkcija uniforme je poleg osnovne funkcije oblačila, ki nas varuje pred vremenskimi in drugimi negativnimi vplivi okolja, tudi ta, da predstavlja skupino ljudi, ki s svojo pojavnostjo sporočajo svoj položaj in vlogo v družbenem okolju. Estetska vizualna podoba oblačilnega sistema zaposlenih je ob celostni komunikaciji bistvenega pomena pri gradnji identitete podjetja. Kakovostni materiali in njihova izdelava ter delovnim mestom prilagojeni kroji so pogoj, da se zaposleni v uniformah dobro počutijo. Uniforme so oblačilni sistemi, sestavljeni iz oblačil in obutve. Glede na potrebe posameznih služb so prilagojeni namenu uporabe in jih po navadi delimo na delovne, slavnostne ter uniforme, prilagojene različnim drugim namenom.

Ključne besede: uniforma, komunikacija, družba, podjetje, uporabnik

Uniforms directly or indirectly accompany all aspects of our lives, in various institutions and organisations with uniformed staff. The article discusses the viewpoints that create the today's understanding of uniforms, their acceptance in the society and their correlation with the environment. Nowadays, different uniforms are used by armed forces, paramilitary organisations, work organisations, emergency services, associations, restaurants and hotels. Apart from the general function of clothing, as a protection from weather and environment, uniforms have a very important function of representing a group of people, showing their position and associations in the society. A good visual image of the garment is of the essence, next to the full public relations strategy, in building the corporate identity. The quality of materials and the manufacture of garments, and adapting designs to the workplace are important to ensure the employees feel comfortable in their uniforms. The uniforms are full clothing systems, consisting of clothes and footwear. They are adapted to the requirements of particular jobs and are also divided into categories such as work and formal, as well as for numerous other occasions.

Keywords: uniforms, communication, society, company, user