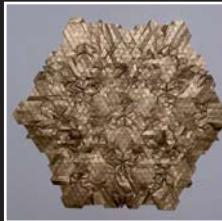


Pučko otvoreno učilište Krapina,
Galerija grada Krapine
Magistratska 25
5. - 20. lipnja 2008.

Open University Krapina,
Krapina City Gallery
Magistratska 25
June 5 - 20, 2008

A ORIGAMI T



POEZIJA U PAPIRU

Prva izložba origami arta u Hrvatskoj
sa svjetskim majstorima
origamija

POETRY IN PAPER

The first origami art exhibition
in Croatia with international
origami masters

Zahvale

Izložbu "Poezija u papiru" organizirali su Pučko otvoreno učilište Krapina, Galerija grada Krapine, u suradnji sa Veleposlanstvom Japana u Zagrebu.

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Posebno zahvaljujemo svim autorima i origamistima koji su poslali svoje radove za ovu izložbu ili dozvolili drugim origamistima da ih predstave te na taj način pomogli promoviranju origami arta u Hrvatskoj.

Galerija grada Krapine sa zahvalnošću i poštovanjem prima origami art modele donirane od: Petra Budai, Joela Coopera, Dragutina Gerića, Mirjane Goletić, Roberta Grettara, Gorana Konjevoda, Michaela G. LaFossea, Bernarda Peytona, Sanje Srblijanović Čuček, Arnolda Tubisa, Davora Vinka, Josepha Wu.

Osobito se želimo zahvaliti svim autorima članaka u ovom katalogu: potpredsjedniku Britanskog origami društva Davidu Brillu, kustosu origami art izložbe u Tikotinu Saady Sternbergu te Goranu Konjevodu, znanstveniku sa Arizona State University.

Osobite zahvale dugujemo Davidu Brillu i Goranu Konjevodu za kontakte i preporuke, posebice Saady Sternbergu za dragocjene savjete kustosa i posudu modela iz njegove privatne zbirke.

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Sanja Srblijanović Čuček, autorica izložbe

Pučko otvoreno učilište Krapina, Galerija grada Krapine

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Sanja Srblijanović Čuček, author of the exhibition
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Origami idoli i ideali

Some personal views

Origami Idols and Ideals of Yesterday and Today

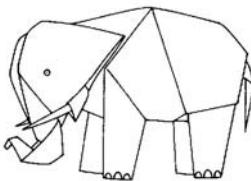
Kao mladi origamist, 70-tih sam godina bio fasciniran zapadnjačkim inženjerskim remek djelima tog vremena, npr. Rhoadovim Slonom, Cercedinim Maurom na konju, Eliasovim Trenutkom istine. U to sam doba imao potrebu impresionirati, kako bi moja "publika" (uglavnom obitelj i prijatelji) mogli reći, "Zar si to stvarno napravio iz samo jednog komada papira?!" Moji prvi susreti s britanskim stvaraocima 70-tih, poput Martina Walla i Maxa Hulmea, koji su kasnije postali moji prijateljski rivali, samo su pojačali taj stav. Na konvencijama Britanskog origami društva (BOS) prikazivali bi vanjštinom slične, autorske modele poput tenka s rotirajućom kupolom (Wall) i čovjeka na Penny-Farthing biciklu. (Hulme). Ova zadržljivost kompleksnim savijanjem prevladavala je u BOS krugovima kasnih 70- tih i 80-tih, a izložbeni stolovi na konvencijama bili su prepuni složenih modela nesumnjivo raznolike estetske vrijednosti. Mnogi od tih modela bili su odeblijeni, budući da su morali biti savijani iz kvadrata metalne folije ili laminata vrlo tankog papira i metalne folije, materijala koji su mi danas mrski! Tako dizajnirani modeli pokazivali su malo poštovanja spram kvalitete papira, ili oblika i obriša predočenog, a još manje prema bilo kakvom stvarnom "životu." Često su bili iskrivljeni u našim pokušajima da budemo strogo točni, vjerujući da trebamo pokazati svaki mogući detalj naših odabralih tema. Izvanredni Hulmeov oldtimer imao je čak volan i mjenjač s promjenom boje na ručici! Origami je tada izgledao kao izazov ili

As a young folder in the 70's I was fascinated by the western origami engineering masterpieces of the day, e.g. Rhoad's Elephant, Cerceda's Moor on Horseback, Elias' Moment of Truth.

At that time, I felt a need to impress, so that my "public" (mainly family and friends) would say, "Did you really make that from just one piece of paper?!"

My first meetings with British creators of the 70's such as Martin Wall and Max Hulme, who were later to become my friendly rivals, reinforced this attitude. They had a similar outlook, displaying designs at BOS conventions such as tank with rotating turret (Wall) and man on penny-farthing bicycle. (Hulme). This admiration of complex folding was prevalent in BOS circles in the late 70's and 80's, and convention display tables were filled with complex designs of decidedly mixed aesthetic value. Many of these pieces were thick, being necessarily folded from rectangles of foil or tissue-foil paper, materials I consider hateful today!

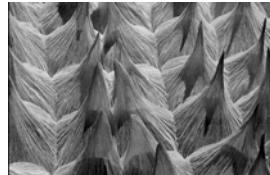
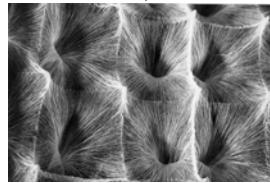
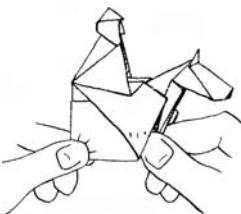
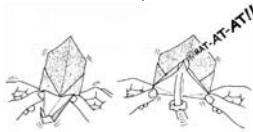
The designs showed small regard either for the qualities of the paper or the form and shape of the subject, and far less any real "life." They were frequently contorted in our attempts to be strictly accurate, and our belief that we should show every possible detail of our chosen subjects. Hulme's remarkable vintage car had a steering wheel and a gear stick, with a colour change gear knob! Origami seemed then to be a challenge or a puzzle, not an artistic pursuit. Our



zagonetka, a ne umjetničko pregnuće. Tada su nam idoli bili američki origamisti Neal Elias i Fred Rohm. Otprilike u isto vrijeme, na BOS sceni pojavio se mladi student kiparstva, Paul Jackson. Pomalo bunтовnik, otvoreno je kritizirao taj inženjerski pristup. Stil mu je bio minimalistički, a dizajn zapanjujuće jednostavan. Napravio je elementarne maske, životinje te neke originalne pomicne modele poput lajućeg psa, djetlića te konja i jahača. Jackson je, sjećam se, digao dosta prašine u Britanskom origami društvu. Pokazao je vrlo jednostavnu ribu, a netko je prilično podrugljivo prokomentirao: "Dobro, Paul, a koja je to vrsta ribe, pastrva, losos, štuka?" Paul je odgovorio: "No, pa to je samo riba..." Jacksonovi idioli su bili (a pretpostavljam da su još uvijek!) Seiryō Takegawa i Philip Shen.

Zanimljivo je usporediti ova gledišta i protuštretje s origami stilovima i kreacijama vodećih origamista današnjice. Inženjerski stil je još uvijek vrlo popularan, a monumentalna biblija namijenjena dizajnerima origamija, "Tajne origami dizajna" Roberta Lang-a, naglašava taj trend, i očito je još uvijek privlačna mladim entuzijastima koji silno žele impresionirati. Jasno da je terminologija koju je Lang uveo u Tajnama origami dizajna, kao što su izrazi "slaganje krugova i linija savijanja", "jednoosne baze" i "presaćivanje", postala vrlo moderna za nove dizajnere. Langovo iscrpno istraživanje i analitički um pružio je dizajnerima daljnje alate, kao što je njegov računalni program TreeMaker s ciljem da uštedi vrijeme onima koji iz nerezanih kvadrata žele dizajnirati bića s mnogo udova.

Paul Jackson, još uvijek utjecajan, nastavlja izlagati protuargumente ovom inženjerskom stilu. Kaže "Dave, origami svijet jednostavno ne treba JOŠ JEDNOG jelenka!" Jackson je sredinom 90-tih, radeći sa studentima umjetnosti u engleskim koledžima uveo stil prozvan "jedan nabor". Tu je



idols then were the American folders Neal Elias and Fred Rohm.

However, at about the same time, a young sculpture student, Paul Jackson, arrived on the BOS scene. A bit of a rebel, he was openly critical of this engineering approach. His style was minimal, and his designs were strikingly simple. He produced elemental masks, animals and some original action models such as barking dog, woodpecker, and horse and rider. Jackson ruffled quite a few BOS feathers I recall. He showed a very simple fish and someone rather sneeringly commented "Ok, Paul, but what species of fish is it, a trout, a salmon, a pike?" Paul replied: "Well, it's just a fish." Jackson's idols were (and I guess still are!) Seiryō Takegawa and Philip Shen.

It's interesting to compare these viewpoints and crosscurrents with the origami styles and creations of leading folders today. The engineering style is still very popular, and Robert Lang's monumental bible for origami designers, "Origami Design Secrets" emphasises the trend, still clearly attractive to young enthusiasts who are ever anxious to impress. It's apparent that

the terminology which Lang introduced in ODS, such as "circle packing and rivers", "uniaxial bases" and "grafting" has become very fashionable for new designers. Lang's exhaustive research and analytical mind has provided designers with further tools, such as his computer programme Treemaker which is aimed at saving time for those who wish to design many-limbed creatures from uncut squares.

Paul Jackson, still influential, continues to expound counter arguments to this engineering style. He says "Dave, the origami world just doesn't need ANOTHER stag beetle!" Jackson pioneered a style called "one crease" while working with art students in colleges around England in the mid '90s. Here

igra svjetla i sjene na skulpturalno oblikovanom arku važnija od minucioznih detalja. Njegovi eksperimenti s gužvanjem papira, pri čemu su nebrojeni nabori na nekom arku postavljeni na sumce - začudo suprotno minimalnom savijanju, potakli su Francuza Vincenta Floderera da otvori vrata u čitav novi svijet. Floderer svojim organskim oblicima inspirira mnogobrojne sljedbenike "TEHNIKE GUŽVANJA". Pred nekoliko godina, za posjeta Flodererovu studiju kraj Brivea u Francuskoj, shvatio sam kako njegova zaokupljenost da ponavljanim preklapanjem i gužvanjem iz jednog arka izvuče nebrojene vrhove, odražava moje vlastite rane origami opsesije - koliko bih korisnih vrhova mogao dobiti iz jednog kvadrata? Flodererov je stil gužvanja, naoko slučajan i dezorganiziran, međutim isto toliko analitičan i promišljen kao i Langovi reprezentativni inženjerski modeli.

Usprkos tome, u nekoliko je zadnjih godina mnogo mlađih dizajnera Istoka i Zapada bilo zaokupljeno kukcima i svim njihovim nožicama, ticalima, krilcima i rilcima, opsesivno tražeći točnost. Popularni su i dinosauri, zmajevi, likovi naučne fantastike i stripova: to je možda zato što zapravo nitko ne zna kako oni stvarno izgledaju. Tako origami umjetnik može biti fleksibilan u svom prikazu, budući da nema živog primjera kojeg bi se trebalo držati. Vjerojatno ništa bolje informiran, i kritični će promatrač dozvoliti veliku slobodu u proporcijama i obliku. Zadatak sastavljanja svih "djelića" sad je puno lakši, zahvaljujući dostignućima kao što je korištenje Eliasove tehnike plisiranja kutija, vanjskim pomagalima kao što je TreeMaker, te principima koje je Lang vrlo jasno objasnio u Tajnama origami dizajna. Istaknuto je i recentno stvaralaštvo francuskog majstora origamija Erica Joisela: njegovi glazbenici i figure možda graniče s kićem, no oni su puni života i ekspresivni te pokazuju kako Joisel nije dozvolio da njegova dokazana tehnička vještina nadvlada njegov umjetnički senzibilitet.

light and shade playing on a sculpturally formed sheet are more important than minute detail. His experiments with crumpling sheets where innumerable creases are randomly placed onto a sheet - curiously the opposite of minimal folding, prompted the Frenchman Vincent Floderer to enter a whole new world. Floderer inspires his many "CRIMP" followers with his organic forms. During a visit to Floderer's studio near Brive in south west France a few years ago, I realised that his preoccupation with finding innumerable points from a single sheet, by repeatedly doubling the sheet and crumpling it, mirrored my own early origami obsessions - how many useable points could I extract from a square? Floderer's crumpling style, though seemingly random and disorganised, is however just as analytical and considered as Lang's engineered showpieces.

Nevertheless, over the last few years, the preoccupations of many young designers east and west, has been for insects with all their legs, antennae, wings and proboscies in an obsessive search for accuracy. Dinosaurs, dragons, sci-fi and comic book characters are popular too: this is perhaps because no one knows what the subjects actually look like. So the origami

artist can manipulate his subject, having no living example as a reference point. Huge liberties of proportion and form can be taken, to be accepted by the critical observer, probably scarcely better informed. The task of including all the "bits" has been made easier now, thanks to developments such as the exploitation of the Elias technique of box-pleating, by outside aids like as Treemaker, and the principles very clearly explained by Lang in ODS.

The recent work of French master folder Eric Joisel is noteworthy: his musicians and figures may border on the kitsch, but they are lively and expressive, and show that Joisel has not allowed his demonstrated technical skill to overpower his artistic sensibilities. There is a growing interest in origami tessellation



Razvija se sve veći interes za stilove origami teselacija, čiji su rani zagovornici bili Shuzo Fujimoto i Chris Palmer. Za mene je taj stil pomalo slijepa ulica, ali je sjajan način istraživanja kreativnih uzoraka nabora. Međutim, Amerikanac Joel Cooper zadivio je origami svijet svojim maskama: tu se teselacijska mreža širi i otvara kako bi oblikovala cjeloviti trodimenzionalni oblik uz suptilne i ekspresivne detalje. Visoko razvijeni osjećaj za oblik i umjetničke vizije Joel Coopera otrgnuo se repetitivnim ograničenjima plosnatih teselacija.

No moj je origami idol još uvijek Akira Yoshizawa. Nemojmo nikad zaboraviti neke od uputa koje nam je dao: profinjeno poštovanje prema materijalu; nepokolebljiv osjećaj za obris, oblik i unutarnji karakter predočenog; i naglasak na sugestiji, a ne na opisu.

Pogledajte ovog energičnog konja, iz Yoshizawine serije životinja za orijentalni kalendar, gdje su udovi sugerirani suptilnim oblikovanjem, a kretanje i držanje životinje vrlo naglašeno naslućeni.

Autorici ove izložbe, Sanji Srblijinović, prepustam zadnju riječ.

Osjećam se poput ispirača zlata, koji na obali rijeke ispije pjesak u potrazi za zlatnim grumenom - istinskim origami umjetni-kom. Ljudi prolaze s obje obale rijeke. S jedne je strane mnoštvo djece i mlađahnih odraslih. Igraju se, razmeću i razbacuju papirom, bez puno poštovanja. Bacaju papirnate aviončice, puštaju papirnate brodiće, izgužvaju poneki tradicionalni model. Miješaju kirigami, origami i origano. Neki tvrde da su to vidjeli u starnim narodnim zanatima.

Druga je obala rijeke strmija i teža za penjanje. Na njoj je malo ljudi. Raštrkani su, usamljeni. Vole i poštuju to što rade. Savijaju papir čistih ruku i čista srca, kako bi to zahtijevao Majstor Yoshizawa.

Ne bi li čudesno sagraditi most, pa da ljudi s one mlađahne strane mogu otkriti ljepotu i mudrost istinske origami umjetnosti?



styles pioneered by Shuzo Fujimoto and Chris Palmer. For me this style is a bit of a blind alley, but it is a fine means to explore creative pattern making. However the American Joel Cooper has astonished the origami world with his masks: here a tessellated grid is stretched and opened to form a fully three-dimensional shape with subtle and expressive detail. Joel Cooper's highly developed sense of form and artistic vision has broken away from the repetitive restrictions of flat tessellation work.

But my origami idol is still Akira Yoshizawa. Let's never forget some of the lessons he showed us: an acute respect for the material; a strong sense of shape, form and inner character of the subject; and an emphasis on suggestion rather than description. Look at this energetic horse, from Yoshizawa's series of oriental calendar animals, where the limbs are suggested by subtle sculpture, and the movement and poise of the animal are very strongly implied.

The curator of this exhibition, Sanja Srblijinović, has the last word.

Presently I feel like a gold miner, on a river bank, sifting sands in search for a gold nugget - a true origami artist. There are people on both river banks. At one side there are lots of children and youthful grownups playing with paper, kicking and tossing it disrespectfully. They fly paper planes, sail paper boats, squash some traditional models. They mix kirigami and origami and oregano. Some claim it is the same as old folk paper crafts. The other bank is steeper and harder to climb. There are few people there, scattered around, lonely. They love and respect what they do. They fold paper with clean hands and clean heart, as Master Yoshizawa would require.

Wouldn't it be wonderful to build a bridge, so that the people from the youthful side could discover the beauty and wisdom of true origami art?

Zašto je origami poseban?

What Makes Origami Special?

Od papira je. Prhkog, suhog, tankog, možda šarenog — pa ga vežemo uz zamatanje poklona, a samim tim i uz davanje poklona, uz krhkost i svježinu cvijeća — ili je možda samo od običnog smeđeg ili bijelog papira, pa je tako i najšire dostupan i nearistokratski koliko to neki materijal može biti. A sve što origami osim papira treba je — inteligencija. Savijen je od papira. Upravo kroz nabore prodire inteligencija: tu um prožima papir. Redovito, na listu papira se javlja svojevrsna geometrija — počevši (obično) s oblikom kvadrata i nastavljajući se kroz raznolike promjene oblika modela. Sam slijed savijanja može biti prirođan ili umjetan, logičan ili čudljiv, formalno repetitivan ili prepun vlastitog ritma i iznenadeženja. Tipično, poezija slijeda savijanja odražava se i u konačnom objektu. A opet nije samo geometrijska inteligencija niti poetski slijed savijanja sačuvan u konačnom rezultatu: odražena je i osobnost svakog pojedinačnog origamista, poput potpisa, u podatni je papir utisnuta ruka tvorca. Snaga, nježnost, razmetanje, plahost, obzirnost, opsativno ponavljanje, ili veličanstvena kićenost — sve te kvalitete karaktera mogu osvanuti na listu savijenog papira. Jer papir je od svih materijala koje je ljudska umjetnost ikad poznavala najprijemčiviji.

Savijen je od nerezanog i nelijepljenog papira. Ta su ograničenja bitna. Tjeraju um da pronađe rješenja. Umjetnost drže, u svim njenim potezima i taktiziranjima, jedinstvenom igrom, poput šaha. Čuvaju integritet neokrnjenog lista — pa time i poštuju vrijednost nevinosti, misterij i potencijal netaknute opne. Dozvoljavaju svakom konačnom koraku da bude vraćen, ako je potrebno, čak i do kraja

It is from paper. Crisp, dry, thin, perhaps colorful—and so allied with gift wrapping, hence with gift giving, and with the fragility and freshness of flowers—or possibly plain brown or white, and so as widely available and unaristocratic as a material can be. All that origami needs in addition to paper is—intelligence.

It is from paper, folded. The creases are where the intelligence comes in: where mind impregnates paper. Invariably, a geometry of some kind appears in the sheet—starting in the (usually) square initial shape and continuing through each of the developing model's permutations of form. The sequence of folds itself can be natural or artificial, logical or whimsical, formally repetitive or full of its own rhythm and surprise. Typically, the poetry of a fold-sequence is reflected also in the final object. Yet it is not merely a geometric intelligence or a poetic fold-sequence which is preserved in the end-result: each individual folder's personality is reflected there too, like a signature, in the impress of that maker's hand upon the pliant paper. Force, gentleness, bravado, timidity, thoughtfulness, obsessive repetition, or the grand flourish—all these qualities of character can come across in a piece of folded paper. For paper is the most receptive of the materials human art has known.

It is from folded paper, uncut and unglued. These limitations are essential. They force the mind to find solutions. They keep the art, in all its diverse moves and stratagems, a single game, as chess is. They preserve the integrity of the continuous sheet---and so respect the value of chastity, the mystery and potential of the uncut membrane. They allow

odmotan do ravnog kvadrata. Ta reverzibilnost očituje jedinstvo ili zajedničko očinstvo svih različitih predmeta origamija, ali isto tako cijelom tom pregrnuću pridaje osjećaj natjecanja, inteligentne igre. Jer nije bilo sudbonosnih rezova, niti trajnih veza koje se ne bi dale razriješiti. Svaki se korak u principu može vratiti ili oblikovati drugačije. To pri-donosi slobodi ili svježini koja zrači iz tih djela.

Slijed savijanja papira može se poučavati. Origami je u svojoj biti komunikativna i dijeljena umjetnost. Modeli se tipično dizajniraju tako da ih i drugi mogu napraviti. Dok je u većini skulpturalnih umjetnosti svaki čovjek prepušten sam sebi, tu je situacija više kao u glazbi: lijepi se dizajn može doživjeti "u izvedbi" mnogo ljudi, a ne samo od samog "kompozitora" — možda čak i bolje od njega. Potiče se interpretacija. Reakcija je brza i dolazi iz više izvora, tako da ta umjetnost u cjelini brzo postaje sve bolja. Osim toga, baš kao u glazbi, origami dizajn se može komunicirati i licem u lice i indirektno, kroz grafičke dijagrame (koji su poput glazbene partiture). Ta dualna prenosivost, koja je skorijeg datuma — standardna se notacija za prikazivanje origami koraka kroz dijagrame etabrirala tek pred 60 godinama — dovela je do prave eksplozije broja izmišljenih origami modела i do nagle internacionalizacije tog područja. Najnovije kreacije najpopularnijih stvaratelja, brzo se šire svijetom, što je sad još više ubrzano Internetom. Danas se u desecima zemalja, svake godine održavaju konvencije, gdje na stotine origami entuzijasta prikazuju svoja postignuća i gorljivo razmjenjuje savjete i tehnike.

Što origami čini posebnim? To se u posljednje vrijeme pitaju i direktori muzeja. Jer se u zadnjih desetak godina, sve češće, velike izložbe origami arta održavaju u vodećim svjetskim izložbenim prostorima (primjerice: muzej Peabody-Essex kraj Boston-a; Tikotin muzej japanske umjetnosti u Haifi; Galerija Pendulum u Vancouveru; Hangar-7 u Salzburgu;

each final result to be reversed, indeed unfolded if necessary all the way back to the flat square. This reversibility makes evident the unity or common paternity of all the different objects of origami, but it also adds to the sense of the entire enterprise as a game, as intelligent play. For no fateful cuts have been made, and no permanent bondings which can't be undone. Each step can in principle be taken back, or handled a little differently. This adds to the freedom or freshness which shines from the works.

A paper-fold sequence can be taught. Origami is fundamentally a communicative and shared art. Objects are typically designed so that others can make them too. Whereas in most of the plastic arts it is every man for himself, here things are more like in music: a nice design will be "performed" by many people besides the "composer"—perhaps even better than he can. Interpretation is encouraged. Feedback is quick and comes from multiple sources, so the art as a whole quickly grows better. Also, just as in music, origami designs can be communicated both face-to-face and indirectly, through graphic diagrams (which are like musical scores). This dual-transmissibility, which is recent—the standard notation for diagramming origami moves was settled on only 60 years ago—has led to an explosion in the number of origami models invented and to a rapid internationalization of the field. The latest designs by hot creators quickly hop across the globe, a process sped up still more now by the Internet. Conventions are now held every year in dozens of countries, where hundreds of folding enthusiasts show off their productions and eagerly share tips and techniques.

What makes origami special? This question is being asked too by Museum directors lately. For increasingly over the last decade or so, large-scale exhibitions of origami art have been held in leading venues around the world (such as: the

Muzej za umjetnost i obrt u Hamburgu; Muzej Minge i San Diegu; Louvre u Parizu; te kao dio upravo zatvorene izložbe 'Dizajn i elastični um' u Muzeju moderne umjetnosti MoMA, New York). Beziznimno začuđuje velika posjećenost tih događanja i entuzijazam posjetitelja. Ova tema privlači sve dobne skupine i društvene klase. Zašto je origami uspješan tamo gdje se ostala suvremena umjetnost probija? Pa origami stvarno i jest drugačiji. Može biti suvremen (većina njegovih vodećih imena je još uvijek živuća) ali nije uperen protiv tradicije, jer duboko poštuje svoje porijeklo staro stotinama godina. Ne podcjenjuje niti rukotvorine, već ih naprotiv cjeni - jer je po sebi od svih rukotvorina najviše vođen upravo rukama. Ništa se ne priječi između prstiju tvorca i skulpture koja se oblikuje. Ne zadržava se na kaosu i zbrci modernog života, već svoj intelekt troši na priličan problem, kako iz kvadrata dobiti dobru zlatnu ribicu. Nema veze sa Velikim Umjetničkim Imenom, ni njegovom glamuroznosću — jer je ono do čeg mu je stalo običan papir, pa odatle i veza sa običnim ljudima. A to je ono što privlači mase. Jer sve što origami čini, jest malo čarobno nešto gotovo ni iz čega. To je još uvijek "samo list papira", ali sada s dovoljno genija, geometrije i duha da vam izmami osmijeh.



Peabody-Essex museum near Boston; the Tikotin Museum of Japanese Art in Haifa; the Pendulum Gallery in Vancouver; Hangar-7 in Salzburg; the Museum fur Kunst und Gewerbe in Hamburg; the Mingei Museum in San Diego; the Louvre in Paris; and as part of the just-closed 'Design and the Elastic Mind' exhibit at MoMA, New York). Invariably there is surprise at the vastly increased attendance rates these shows bring, and at the enthusiasm of the visitors. All age groups and social classes seem to be drawn to this subject. Why is origami successful were the other contemporary arts are struggling? Well, but origami really is different. It may be contemporary (most of its leading figures are still alive today) but it is not anti-traditional, for it has a deep respect for its centuries-old origins. It does not disparage handicraft either, but rather values it—for it itself is the most 'handy' of crafts, nothing coming between the makers finger's and the sculpture being formed. It does not dwell on the chaos and disorder of modern life, but expends its intellect on the considerable problem of making a good goldfish out of a square. It has nothing to do with the Big Name Artist or his glamour — for what it cares about is ordinary paper, and through it, the connection with ordinary people. And this is what draws the crowds. For all origami does, is make a little magical something out of almost nothing. It is still "just a sheet of paper" but now with enough genius, geometry, and spirit, to make you smile.

Origami znanost, matematika i tehnologija

Origami Science, Mathematics and Technology

Odnos origamija s jedne strane, i znanosti, matematike i tehnologije s druge, odnos je recipročne inspiracije i utjecaja. U dizajniranju origami modela, kontinuirano se rješavaju problemi matematike (geometrije), fizike i inženjerstva.

Istovremeno, origami konstrukcije pomažu u rješavanju problema tehničkog i industrijskog dizajna u stvarnom svijetu, kao što je olakšavanje sklapanja i otvaranja zemljopisne karte, ili pak gradnja leće teleskopa koja se može transportirati skupljena u svemirskom shuttleu manjem od leće same, i kasnije raširiti.

U ovom kratkom uvodu u znanstvenu stranu origamija dati će nekoliko primjera bez da nastojim biti opsežan, ili da pokušavam pokriti neke detalje. Sugestije za daljnju literaturu navedene su na kraju članka.

10

Origami kao geometrijska transformacija

Kreiranje prepoznatljivih oblika iz kvadratnog lista papira istovremeno je i potaknuto i ograničeno geometrijom. Neka je ograničenja lako vidjeti, dok druga nije. U stvari, postoje svojstva koja bi očito trebala vrijediti za bilo koji predmet savijen od lista papira, a zapravo uopće nisu istinita.

Primjer.

Jedan od prvih teorema u origamiju otkrio je Kawasaki. Uzmite neki vrh na spljošteno savijenom komadu papira i izmjerite kutove između linija savijanja oko tog vrha. Zbrojimo li vrijednosti svakog drugog kuta, zbroj će uvijek iznositi 180 stupnjeva.

Primjer.

List papira je predmet određene veličine. Savijajući ga, poravnavamo neke dijelove i na taj način smanjujemo list. Stoga je očito da iz lista s opsegom od recimo, 40cm, ne možemo sav-

The relationship between origami on one side, and science, mathematics and technology on the other, is that of reciprocal inspiration and influence.

In designing origami models, one continually solves problems of mathematics (geometry), physics and engineering.

At the same time, origami constructions help in solving real-world engineering design problems, such as making a map easy to fold and unfold, or an building an expandable telescope lens that can be transported into space in a space shuttle smaller than the lens itself.

In this short introduction to the scientific side of origami, I will give some examples without attempting to be comprehensive, or to cover any details. Suggestions for further reading are listed at the end of the article.

Origami as geometric transformation

The creation of recognizable shapes from a square sheet of paper is both guided and limited by geometry. Some of the limitations are easy to see, but others are not. In fact, there exist properties that should be obviously true of any object folded from a sheet of paper that, in fact, are not true at all.

Example.

One of the first theorems about origami was found by Kawasaki. Take a vertex in a flat-folded piece of paper and measure the angles between the creases around the vertex. If we add up the values of every other angle, the sum will always be 180 degrees.

Example.

A sheet of paper is an object of fixed size. By folding it, we align some parts and thus make the sheet smaller. Thus it is

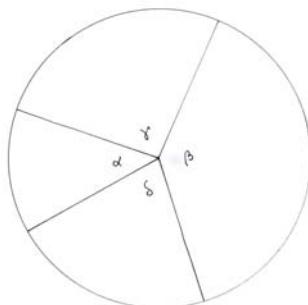
iti oblik s opsegom, recimo, 10m. Međutim, ispostavlja se da ta očita činjenica nije točna: počevši od kvadrata bilo koje zadane veličine, možemo saviti oblik opsega velikog koliko god to želimo.

Primjer.

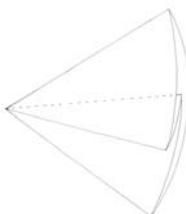
Od lista papira obojenog crno s jedne, a bijelo s druge strane, moguće je saviti, bez rezanja, šahovsku ploču: mrežu osam sa osam naizmjenično crnih i bijelih kvadrata. To nije očito, no nekoliko je origamista, kao što su Max Hulme, John Montroll i Stephen Casey našlo nekoliko različitih načina da to postignu. Istina je i više od toga: moguće je saviti šahovske ploče s proizvoljno mnogo kvadrata. Ono što nije poznato je koliko točno šahovska ploča treba biti manja od originalnog lista papira. Postoji intuitivno očit razlog da najveća šahovska ploča osam sa osam od kvadrata 40 sa 40 cm ne bi trebala biti veća od 10 sa 10 cm, no kao što vidimo iz primjera opsega, nije uvjek lako pomiriti intuiciju i matematičku činjenicu, i one se ne moraju podudarati.

Fizička ograničenja origamija

Kao što zna svatko tko je pokušao saviti komplikirani model, mogućnosti u savijanju papira nisu ograničene samo matematičkim ograničenjima. Stvarni papir ima deblinu, pa savijanje kroz više slojeva nije niti lako, niti je vjerojatno da će dati pre-



$$\alpha + \beta = \gamma + \delta = 180^\circ$$



obvious that from a sheet with perimeter, say, 40cm, we cannot fold a shape with perimeter, say, 10m. However, this obvious fact turns out not to be true: starting from a square of any given size, we can fold a shape with perimeter as large as we wish.

Example.

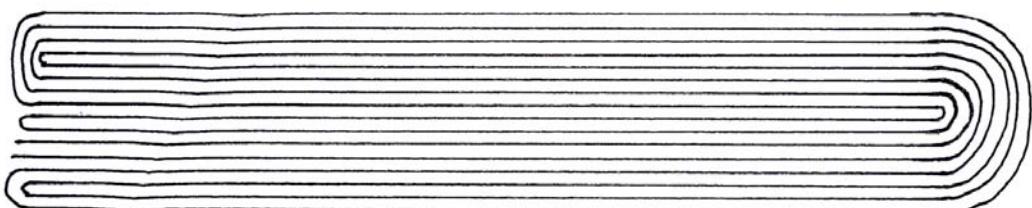
From a sheet of paper colored black on one side and white on the other, it is possible to fold, without cutting, a chessboard: an eight by eight grid of alternating black and white squares. This is not obvious, but several different ways to do this have been found by paperfolders such as Max Hulme, John Montroll and Stephen Casey. More than this is true: checkerboards with arbitrarily many squares can be folded. What is not known is exactly how much smaller will a

chessboard need to be than the original sheet of paper.

There is an intuitively obvious reason that the largest eight by eight chessboard from a 40 by 40 cm square should not be larger than 10 by 10 cm, but as we see from the perimeter example, intuition and mathematical fact are not always easy to reconcile, and may not agree with each other.

Physical limitations of origami

As anyone who has tried folding a complicated model knows, more than just mathematics limits the possibilities in pa-



cizne rezultate. Zapravo, često se čuje da se "list papira ne može saviti na pola više od 8 puta," što se odnosi na činjenicu da svako takvo savijanje podvostručuje broj slojeva. Kad jednom presavijeni papir postane deblji nego što je širok, postaje teško savijati ga dalje. (Kad je već o tome riječ, 8 svakako nije ispravan broj; 12 je postignuto, a kad bi se moglo dobiti tanji i dulji papir, čak i to ne bi bio maksimalan broj.)

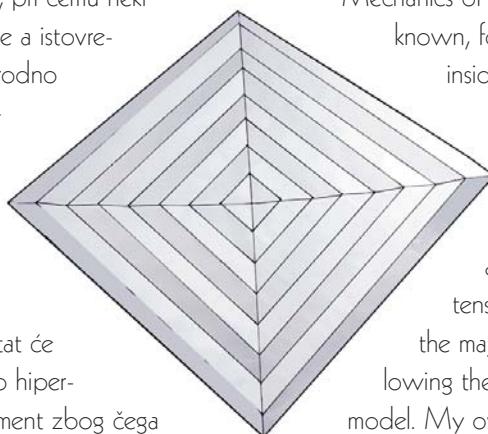
Postoje i druga fizička ograničenja savijanja, a sva ona potječu od fizičkih osobina papira koji se savija.

Promjena papira dovodi do novih mogućnosti: tanak papir omogućava slaganje više slojeva, dok debeli papir daje snagu i otpornost. Ponekad se papir pokušava modificirati dok se savija. Mokro savijanje pomaže preraspodijeliti učvršćivač unutar arku, tako da papir zadrži svoj oblik nakon što se osuši. Metil-celuloza arku dodaje više čvrstoće i djeluje kao ljepilo. (To isto tako znači da tvrdnju kako su neki modeli savijeni bez upotrebe ljepila treba uzeti sa zrncem soli, budući da isti umjetnici ne trepnuvši okom koriste metil-celulozu).

Mehanika papira je još neistraženo područje. Vrlo je malo poznato, primjerice o napetosti koja nastaje u listu papira kad ga se savija. Lako je vidjeti da presaviniti list ima tendenciju razmatanja, no neki papiri ostaju savijeni gotovo plosnato, a drugi ne. Origami umjetnici poput Paula Jacksona i Josepha Wu istraživali su suho tenzisko savijanje, pri čemu neki nabori pomažu zadržati oblik kompozicije a istovremeno dopuštaju napetosti papira da prirodno zaoblji model. Moje plisirane zdjele i abstractni oblici su daljnji primjeri ove tehnike.

Primjer.

Savinite koncentrične kvadrate u listu papira, naizmjenično redajući kvadrate udubljenog i ispuštenog savijanja. Rezultat će biti sedlasti oblik, matematički poznat kao hiperbolični paraboloid. Postoji intuitivni argument zbog čega



perfolding. Real paper has thickness and folding through many layers is neither easy, nor likely to lead to precise results. In fact, one often hears that "a piece of paper cannot be folded in half more than 8 times," a reference to the fact that each such fold doubles the number of layers. Once the pile of paper becomes thicker than it is wide, it becomes difficult to fold it further. (By the way, 8 is certainly not the right number; 12 has been achieved, and if thinner and longer paper had been available, even that would not have been the maximum number.)

There are other physical limitations to folding, and they all stem from the physical properties of the paper that is being folded.

Changing paper leads to new possibilities: thin paper allows many layers to be stacked, while thick paper lends strength and resistance. Sometimes one even attempts to modify the paper as one folds. Wet-folding helps redistribute sizing within the sheet, so that the paper maintains its shape upon drying. Methyl-cellulose adds more sizing to the sheet and acts as a glue. (This also means that some of the claims about models folded without using glue should be taken with a grain of salt, because the same artists often don't think twice about using methyl-cellulose.)

Mechanics of paper is still a nascent field. Very little is known, for example, about the tension generated inside the paper sheet when it is folded. It is easy to see that a folded sheet tends to unfold, but some papers remain folded almost flat, while others do not. Origami artists like Paul Jackson and Joseph Wu have been exploring dry-tension folds, where certain locking folds keep the major features of the piece in place while allowing the paper tension to naturally curve the model. My own pleated bowls and abstract shapes are

takav oblik minimizira napetost, ali uopće ne izgleda lako dati strogi dokaz koristeći naše sadašnje razumijevanje matematike i fizike materijala.

Dizajn koji koristi origami

Iskustvo u savijanju papira dovelo je do značajnih postignuća u industrijskom dizajnu, koja često zahtijevaju duboko razumijevanje i fizičkih i matematičkih osobina papira.

Primjer.

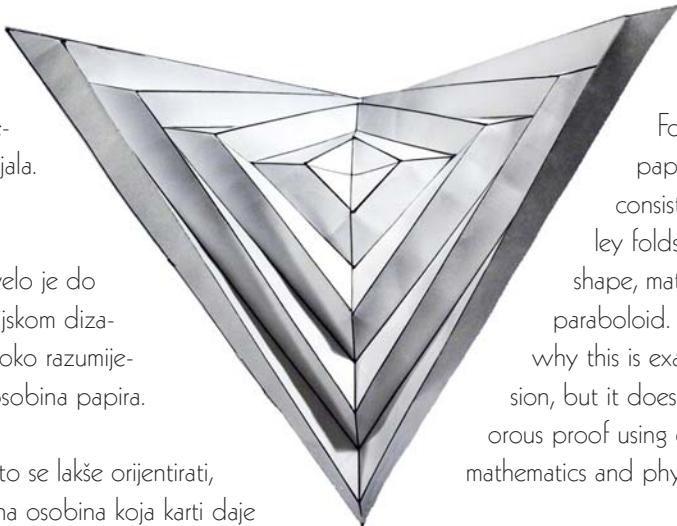
Što je zemljopisna karta veća, to se lakše orijentirati, no teže ju je nositi. Upravo ona osobina koja karti daje korisnost, čini je nespretnom i glomaznom kad je želimo natrag složiti. Treba li je prvo saviti na pola okomito ili vodoravno? Ili možda na trećine? Nakon nekoliko upotreba, nabori se istroše i pucaju, pa trebamo novu kartu. Miurino rješenje temeljeno na poznavanju origamija bio je dizajn karte koja se može saviti na jedinstven način, a ima i dodatnu osobinu da je proces slaganja i razmatanja brz kao jednostavno razvlačenje suprotnih kutova karte.

Primjer.

Stent je cijev uvučena u tijelo koja pomaže da neka žila, kao što je koronarna arterija, ostane otvorena, i omogućava nesmetani protok. Nekoliko je stentova bilo temeljeno na origami modelima. Skupljaju se i umeću u žilu, a zatim manevriraju na mjesto, gdje se rašire.

Matematika origamija

Neki su problemi vezani uz origami riješeni. Značajan je uspjeh doživio TreeMaker, program koji je napisao Robert Lang. Ako mu zadamo vrlo jednostavnu shematsku figuru, primjerice oblik neke životinje sa četiri noge poznatih duljina i glavom određene veličine, program će izračunati efikasan način da



further examples of this technique.

Example.

Fold concentric squares in a sheet of paper, alternating between squares consisting of mountain and those of valley folds. The result will be a saddle shape, mathematically known as hyperbolic paraboloid. There is an intuitive argument for why this is exactly the shape that minimizes tension, but it does not seem at all easy to give a rigorous proof using our current knowledge of mathematics and physics of materials.

Design using origami

Experience with origami has led to breakthroughs in industrial design. These often require a deep understanding of both the physical and mathematical properties of paper.

Example.

The larger a map, the easier it is to navigate, but the harder to carry. The very property that lend usefulness to a map makes it cumbersome and awkward when we try to fold it back down. Should it be first folded in half vertically or horizontally? Or maybe into thirds? After a few uses, the creases wear out and crack, and we need a new map. An origami-aware solution of this problem by Miura was to design a map that can be folded in a unique way, and in fact has the added feature that the process of folding and unfolding is as quick as a simple stretch of the opposite corners of the map.

Example.

A stent is a tube inserted into body to help keep a vessel such as a coronary artery open, and allow for unrestricted flow. Several stents have been based on origami models. They are folded up and inserted into the vessel, and then maneuvered into place, where they expand.

dizajnira taj model sa zadanim proporcijama od kvadratnog lista papira. Posao dizajnera se svodi na otkrivanje slijeda kojim se ti nabori trebaju savijati (premda to nije uvek jednostavno). Tomohiro Tachi je razvijao sličan program koji kao ulazni podatak uzima trodimenzionalnu površinu. Takav je rad doveo do novih razvojnih dostignuća u matematici i računarstvu, osobito u algoritmima.

Primjer.

Erik Demaine i njegovi suradnici dokazali su zanimljivi teorem pomoću origami konstrukcije. Nacrtajte bilo koju siluetu na listu papira koristeći samo ravne linije. Tada se taj list papira može složiti tako da će, nakon što je škarama prorezan samo jedan ravni rez, razmotrani list imati upravo onaj obris kao i početna silueta.



Suggestions for further reading:

- Proceedings of the first international meeting of origami science and technology (Ferrara, Italy, 1989). Edited by Humiaki Huzita.
- Proceedings of the second international meeting of origami science and scientific origami (Otsu, Japan, 1994). Edited by Koryo Miura.
- Origami^3, proceedings of the third international meeting of origami science, mathematics and education (Asilomar, California, 2001). Edited by Tom Hull. AK Peters, 2002.
- Origami design secrets: mathematical methods for an ancient art. Robert J. Lang. AK Peters, 2003.
- Geometric folding algorithms: linkages, origami, polyhedra. Erik D. Demaine and Joseph O'Rourke. Cambridge University Press, 2007.

Mathematics of origami

Certain problems related to origami have been solved. A notable success is that of TreeMaker, a program written by Robert Lang. Given a stick figure, for example, the shape of an animal with four legs of known lengths, and a head of a certain size, the program will compute an efficient way to design the model with the given proportions from a square sheet of paper. The designer's job is reduced to figuring out the sequence in which the folds should be made (though this is not always easy). Tomohiro Tachi has been developing a similar program that takes as input a three-dimensional surface. Such work has led to new developments in mathematics and computer science, especially in algorithms.

Example.

An interesting theorem that uses origami constructions has been proved by Erik Demaine and his collaborators. Draw any silhouette on a sheet of paper using only straight lines. Then this sheet of paper can be folded up so that, after making only one straight cut with scissors, the unfolded sheet will have exactly the same shape as the initial silhouette.

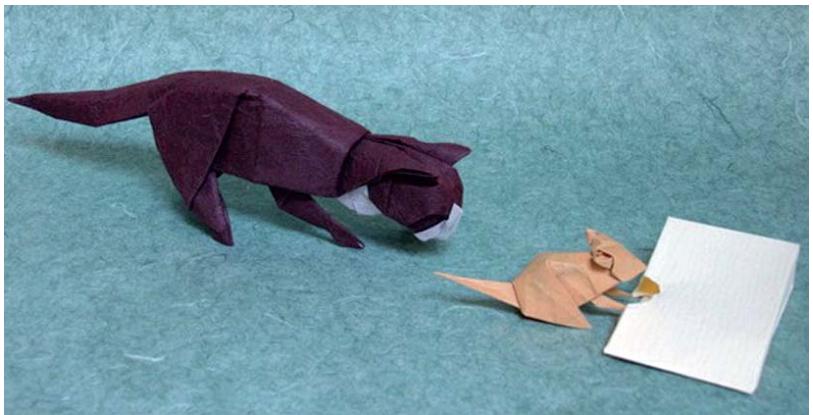
Nosorog
Rhyno
DAVID BRILL

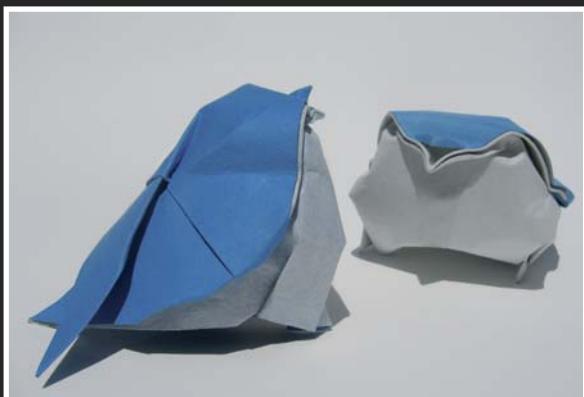


Konj
Horse
DAVID BRILL

15

Mačka miš i sir
Cat Mouse and Cheese
DAVID BRILL





Drozdići
Bluebird Chicks
BERNARD PEYTON

Sovice
Owlets
BERNARD PEYTON



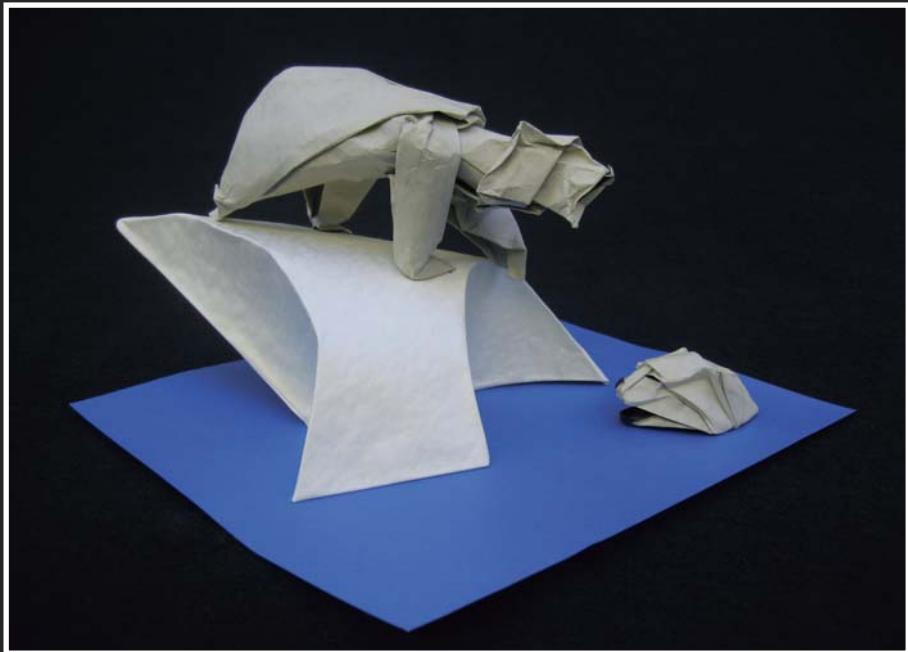
16



Smeđi medvjed s lososom
Brown Bear with Salmon
BERNARD PEYTON



Američka lisica
Kit Fox
BERNARD PEYTON



Nema mesta (polarni medvjedi)

No Room (polar bears)

BERNARD PEYTON

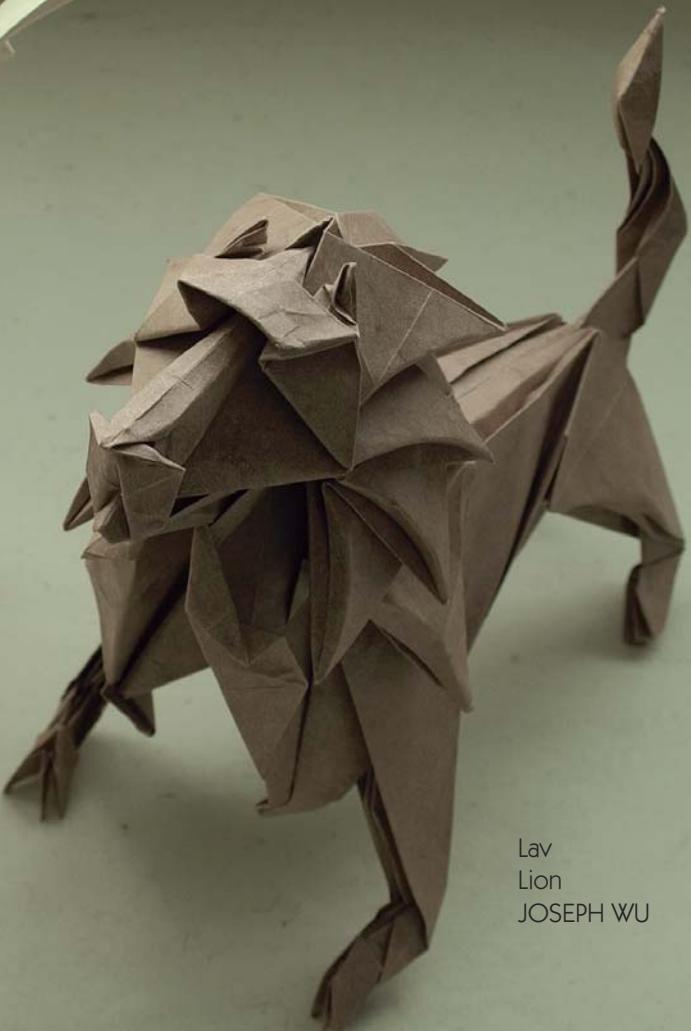
Slonić na oporavku
GetWelephant
BERNARD PEYTON



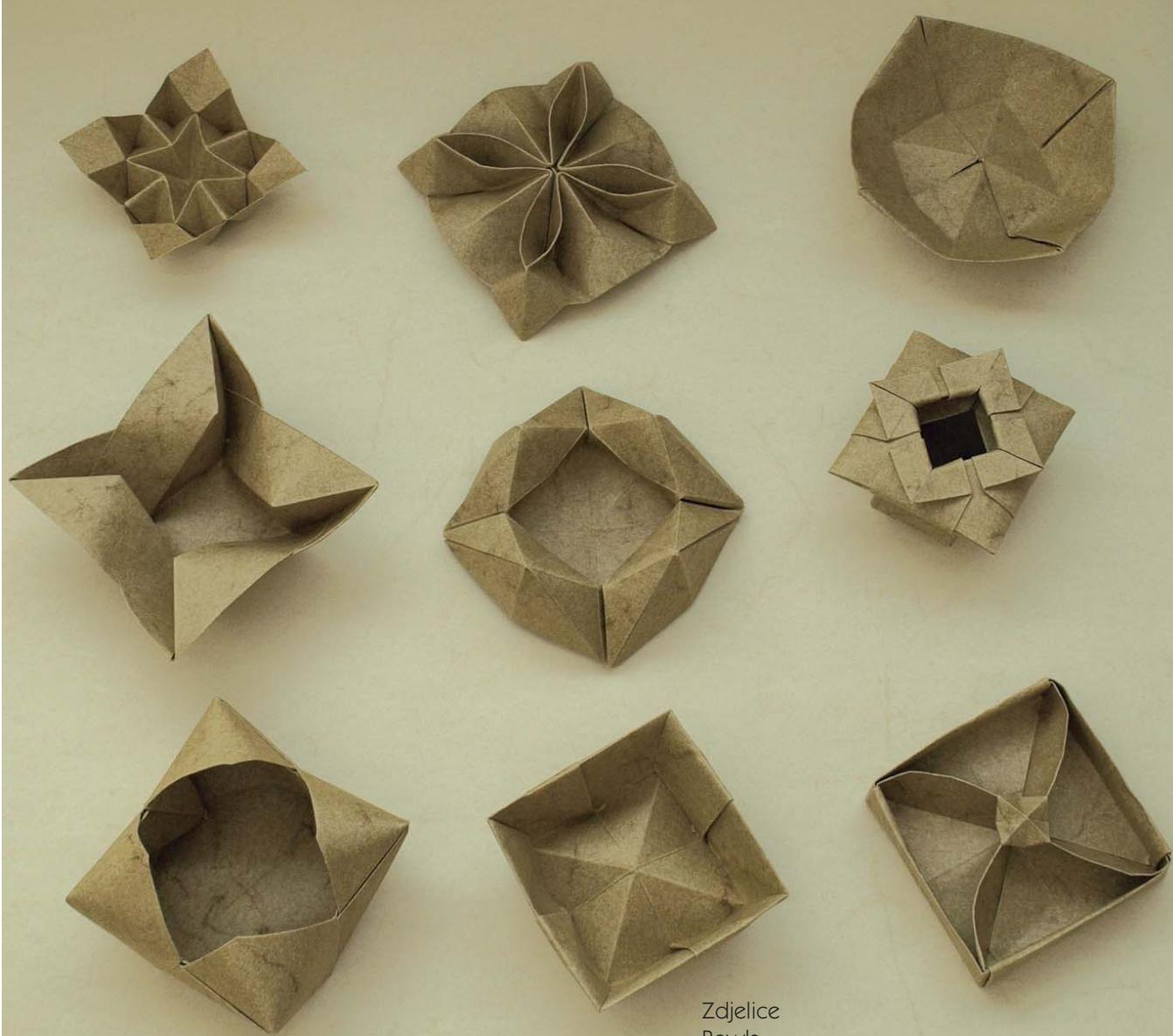
Grifon
Gryphon
JOSEPH WU



Engleski bulldog
English Bulldog
JOSEPH WU

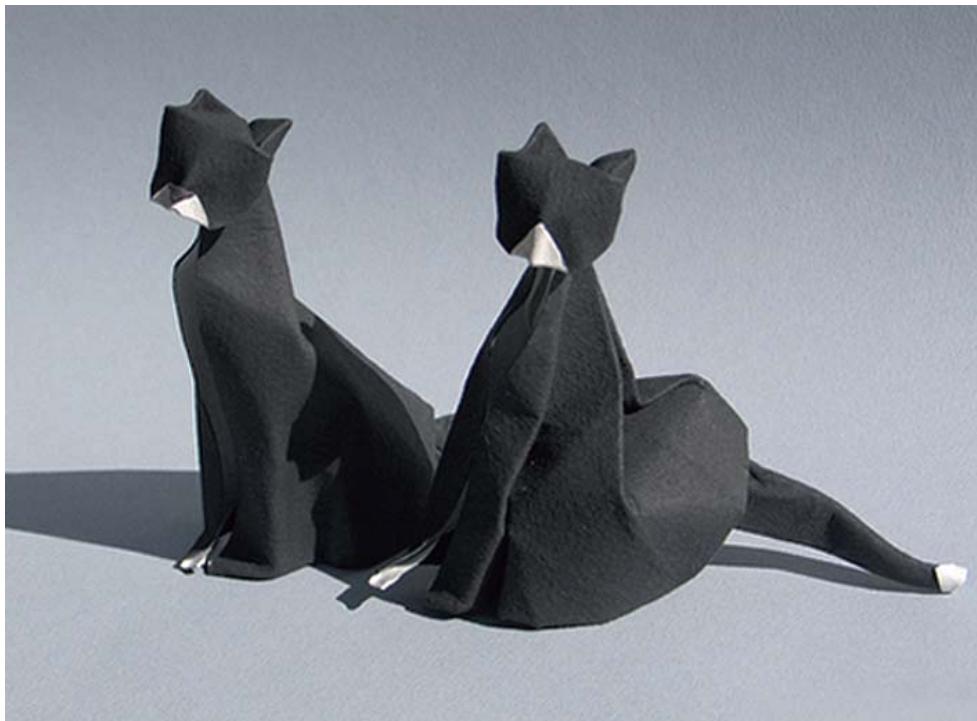


Lav
Lion
JOSEPH WU



Zdjelice
Bowls

Modele PHILIPA SHENA savio Boaz Shuval
PHILIP SHEN by Boaz Shuval



Dvije mačke
Two Cats
GIANG DINH



Četiri zlatne ribice
Four Goldfish
RONALD KOH

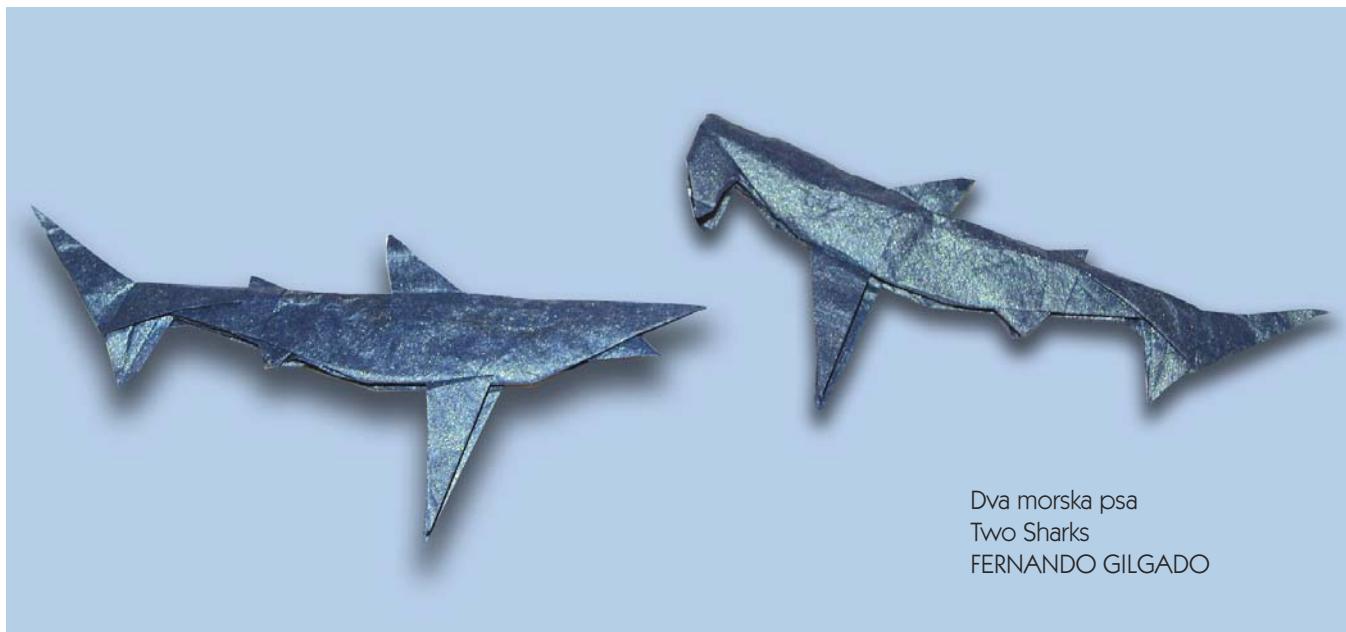
Štakor
Rat
DAVOR VINKO



Školjka
Shell
DAVOR VINKO



Kap
The Drop
ROBERTO GRETTER



Dva morska psa
Two Sharks
FERNANDO GILGADO



Dvostruki val
Double Wave
GORAN KONJEVOD

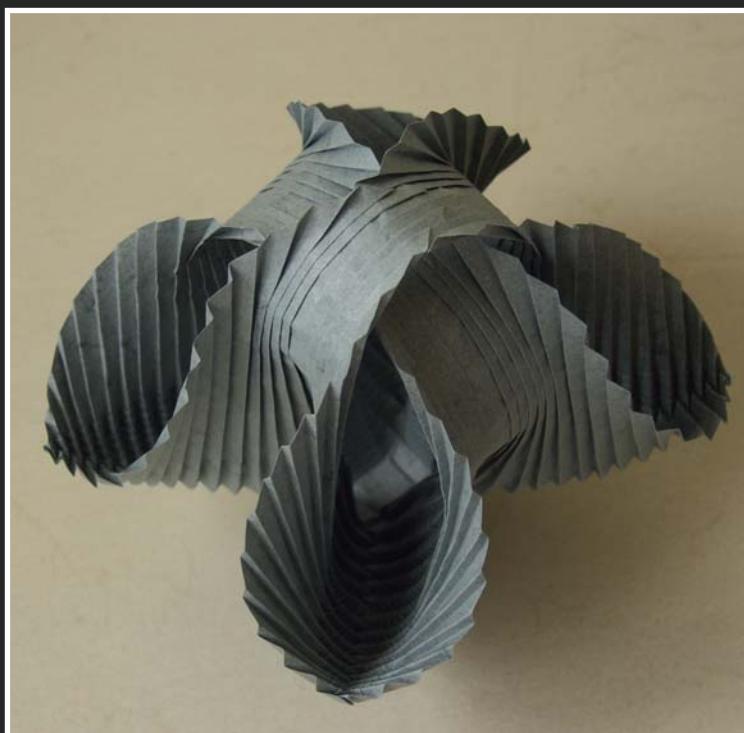


Zdjela drugog reda
Second Order Bowl
GORAN KONJEVOD

22



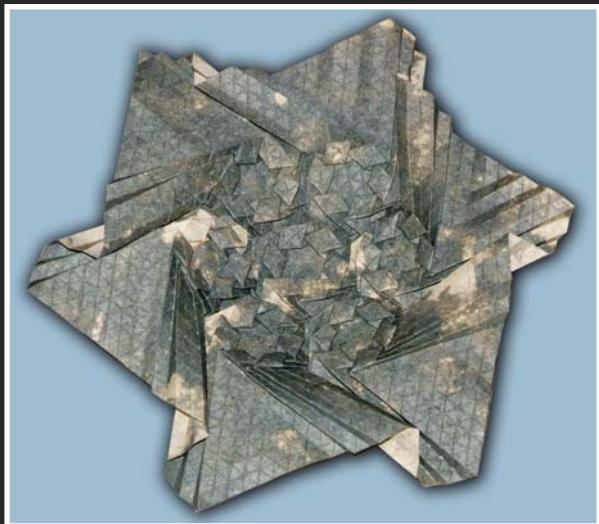
Uska zdjela
Narrow Bowl
GORAN KONJEVOD



Košarica s dvije ručke
Basket with two handles
GORAN KONJEVOD



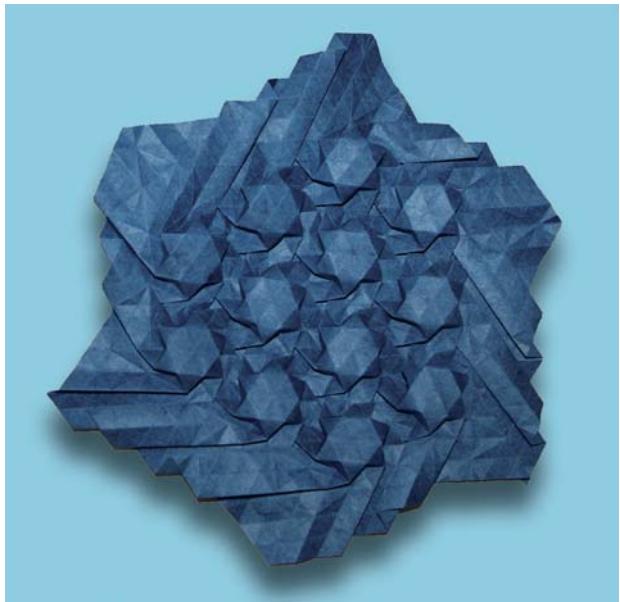
Faraon
Pharaoh
JOEL COOPER



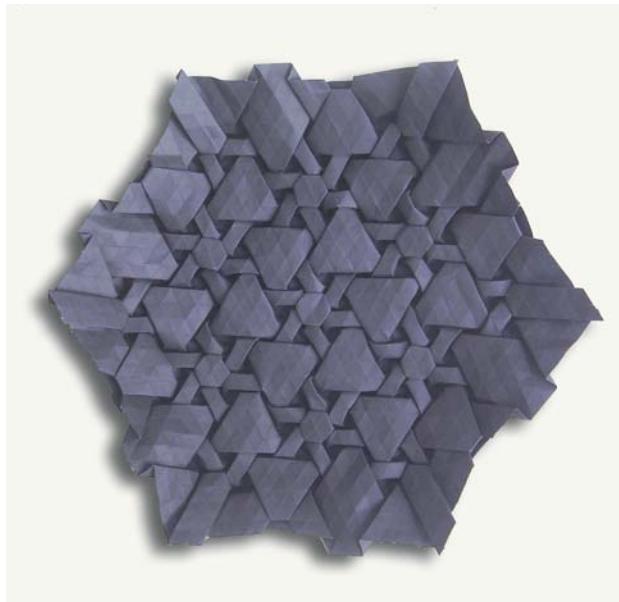
Wreaths
Vjenčići
JOEL COOPER



Zvijezde i rombovi
Stars and Rhombics
CHRISTIANE BETTENS



Modra noć
Blue Night
CHRISTIANE BETTENS



Crna tesselacija
Black Tessellation
CHRISTIANE BETTENS

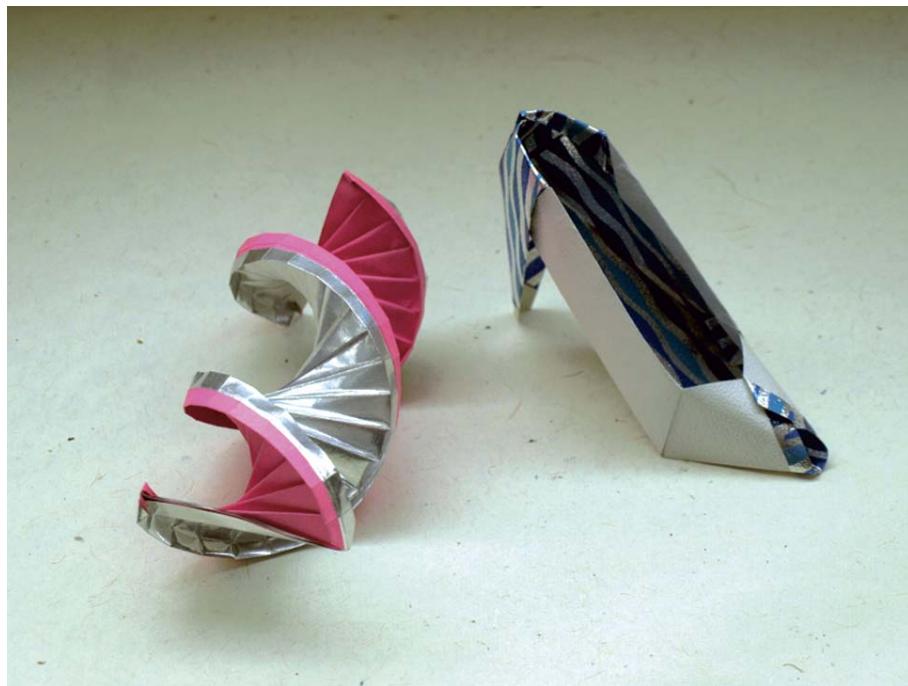
24



Labirint
Labyrinth
CHRISTINE EDISON

Tri cvijeta
Three Flowers
CHRISTINE EDISON





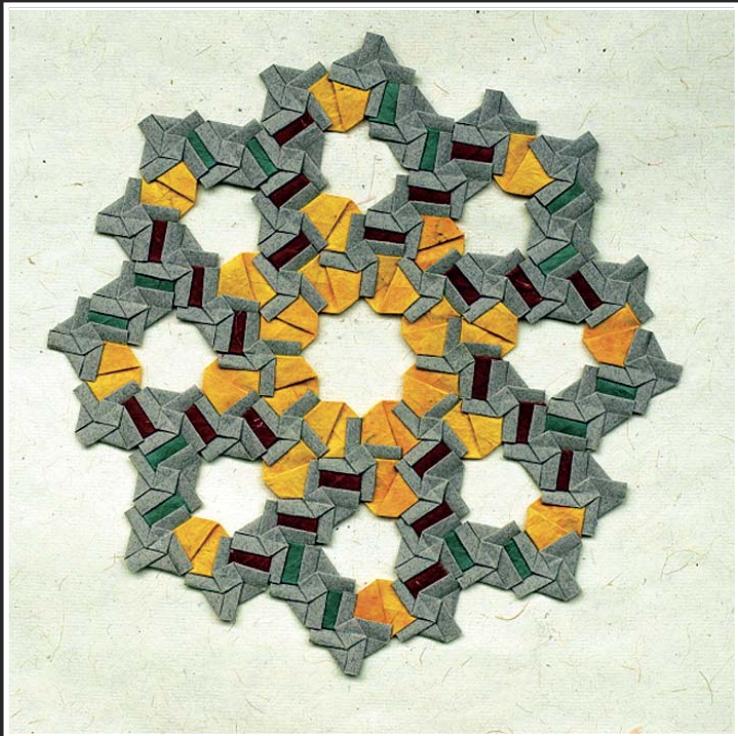
DNA promijenjene boje
Colour-Changed DNA
deg farrelly

Visoka peta
The High Heel
deg farrelly

25



Dekorativna kutija
Decorative Box
ARNOLD TUBIS

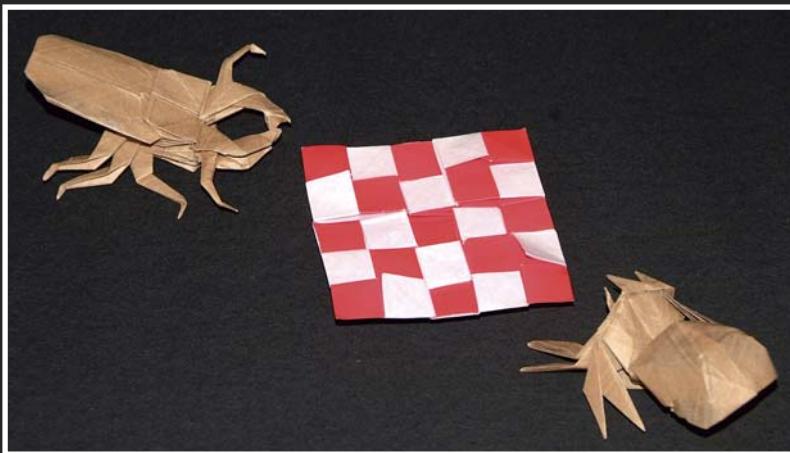


Ornament
Quilt
Model TOMOKO FUSE savio Goran Konjevod
TOMOKO FUSE by Goran Konjevod



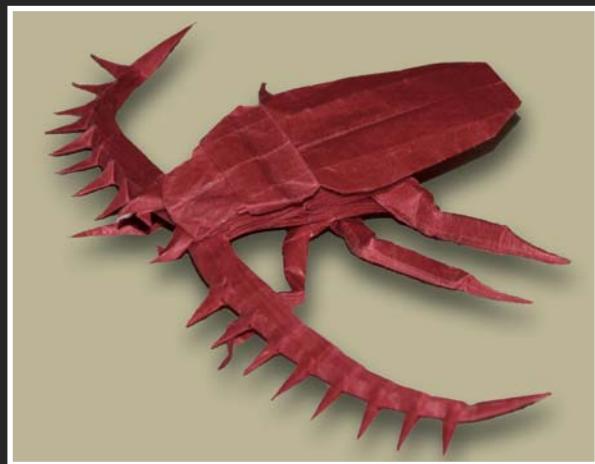
Tri modula
Three Modulars
Modèle
TOMOKO FUSE
savila
Rosana Cohen
TOMOKO FUSE
by Rosana Cohen





Jelenak, šahovnica i pauk
Stag Beetle, Checkerboard and Spider
PETER BUDAI

Leptir
Aztec Alexander Swallowtail Butterfly
MICHAEL LAFOSSE



Vijetnamski žohar
Vietnamese Cockroach
NGUYEN HUNG CUONG

27



Anturium
Anthurium
SANJA SRBLJINOVIC ČUČEK



Lepršave ptice
Flitting Birds
SAADYA STERNBERG



Orao
Eagle
NGUYEN HUNG CUONG

28



Ljiljani
Lillies
MIRJANA GOLETIĆ

Labud
Swan
DRAGUTIN GERIĆ



Lice Indijanca
Indian Face
GIANG DINH

Djevojčica s mačkom
Little Girl and Cat
GIANG DINH



Majka i dijete
Mother and Child
GIANG DINH



Glava žene
Head of a Woman
SAADYA STERNBERG



PRIZNANJA

Akira Yoshizawa, Japan (1911-2005)

Moderno origami umjetnici posebno priznanje odaju vodećem svjetskom origami majstoru, Akiru Yoshizawu, za promicanje origamija u umjetnost i znanost 21. stoljeća. Kreirao je na tisuće origami modela, uveo skulpturalne tehnike i tehniku stabiliziranja, kao što je savijanje na mokro. Uz Samu Randlettu, osmislio je sustav zapisivanja koji se danas koristi u crtanjima origami dijagrama.

ORIGAMI AUTORI

CHRISTIANE BETTENS, Švicarska

Lječnica i u svijetu zapažena origami umjetnica. Za svoje teselacije inspiraciju nalazi u sakralnim i cvjetnim motivima. Kaže: "Origami je kao haiku: stroga pravila, bez suvišnih riječi, no može se izraziti bogatstvo osjećaja. Jednostavnost je srž umjetnosti!"

DAVID BRILL, UK

Potpredsjednik Britanskog origami društva, slikar i jedan od vodećih svjetskih imena origami arta, David Brill je poznat kao "ambasador origamija". U više od pedeset godina posvećenih origamiju, pamti se po svom čuvenom konju, životnim figurama ljudi i mačaka. Autor je knjige *Brilliant Origami*, izdane u Japanu.

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PETER BUDAI, Mađarska

Inženjer ekologije zaljubljen u origami i planinarenje, Peter Budai se origamijem bavi od svoje devete, a prve je knjige o origamiju objavio sa dvanaest. Gostovao je na brojnim međunarodnim origami konvencijama i izlagao na izložbama svjetskih majstora origamija. Član je vodećih svjetskih origami društava.

JOEL COOPER, SAD

Bibliotekar, kipar i istaknuti svjetski origami umjetnik, Joel Cooper je poznat po neobičnim maskama dobivenim širenjem i otvaranjem teselacijske mreže. Iz repetitivnih ograničenja plošnih teselacija izvlači profinjene i ekspresivne detalje u trodimenzionalni oblik.

GIANG DINH, Vijetnam/SAD

Rođen šezdesetih u Vijetnamu, Giang Dinh sad radi kao arhitekt u SAD. Vodeći je origami umjetnik u tehniči mokrog savijanja. Ima osebujno prepoznatljivi stil fluidne skulpture, zapažen na istaknutim svjetskim izložbama origami arta. Bavi se origami dizajnom od 1998.

CHRISTINE EDISON, SAD

Inspiriran djelima Erica Gjerdea i Joela Coopera, njen umjetnički izraz širi granice origami teselacija prema živoj igri geometrijskih oblika. Christine Edison također dizajnira origami modele od novčanica, kutije i modularni origami.

CREDITS

Akira Yoshizawa, Japan (1911-2005)

Modern origami artists pay special tribute to the leading origami master of the world, Akira Yoshizawa, for promoting origami into the art and science of the 21st century. The creator of thousands of origami designs, he also pioneered paper sculpting and stabilization techniques such as wet-folding, and along with Sam Randlett devised the symbol system used in origami folding diagrams to this day.

ORIGAMI DESIGNERS

CHRISTIANE BETTENS, Švicarska

Physician and internationally recognised origami artist. Her tessellations are inspired with sacral and flower motives. She says: "Origami is like haiku: strict rules, no superfluous words, but one can express a wide array of feelings. Simplicity is the quintessence of art."

DAVID BRILL, UK

Vice President of the British Origami Society, painter and one of the leading origami artists in the world, David Brill is known as "ambassador of origami". In over fifty years of his origami devotion, he has been noted for his famous horse, lively human figures and cats. He is the author of *Brilliant Origami*, published in Japan.

PETER BUDAI, Mađarska

Environmental engineer with a devotion to origami and mountaineering, Peter Budai started paper folding at the age of nine, at twelve published his first origami books. A guest artist at numerous international origami conventions, he has exhibited at international exhibitions featuring masters of origami. A member of prestigious origami societies round the world.

JOEL COOPER, USA

Librarian, sculptor and a prominent international origami artist, Joel Cooper is noted for creating distinguished masks by stretching and opening a tessellated grid. He has pushed repetitive restrictions of flat tessellations to subtle and expressive detail in a three-dimensional shape.

GIANG DINH, Vijetnam/USA

Born in the sixties in Vietnam, Giang Dinh now works as an architect in the USA. He is the leading artist in wet-folded origami, with a distinctive fluid sculptural style, noted at prominent international origami art exhibitions. He has been designing origami since 1998.

CHRISTINE EDISON, USA

Inspired by work of Eric Gjerde and Joel Cooper, her origami art is pushing the limits of origami tessellations towards a lively play of geometric forms. Christine Edison has also been designing money folds, modulars and boxes.

deg farrelly, SAD

Sveučilišni bibliotekar i istaknuti svjetski origami umjetnik, deg farrelly se origamijem bavi više od 40 godina. Ranije član Upravnog odbora Američkog origami društva OUSA, vodi origami biblioteku, koja članovima OUSA omogućava posudjivanje rijetkih origami knjiga poštom.

TOMOKO FUSE, Japan

Japanska velikanka origamija, Tomoko Fuse, prokrčila je put geometrijskom i modularnom origamiju. Autorica je preko pedeset origami knjiga. Njene nježne i profinjene kutije čak i sramežljive početnike motiviraju na daljnje istraživanje origami prostora.

DRAGUTIN GERIĆ, Hrvatska

Inženjer elektrotehnike i zaljubljenik origamija. Autor prve origami knjige u Hrvatskoj, Origami - vještina savijanja papira. Preko 40 godina općaran savijanjem papira, vodi krug origami entuzijasta i vodi origami radionice i izložbe.

FERNANDO GILGADO, Španjolska

Bibliotekar iz Madrida, poznat je po tome što radi najbolje morske pse - od origamija. Autor je devet knjiga o origamiju.

MIRJANA GOLETIĆ, Hrvatska

Od 2005. izlaže i vodi radionice u knjižnicama, školama i učilištima. Njeno zanimanje za origami cvijeće brzo je preraslo u kreiranje vlastitih modela.

NGUYEN HUNG CUONG, Vijetnam

Nguyen Hung Cuong, živi u Hanoju. Već osam godina kreira vlastite modele. Mladi je predstavnik Vijetnamske origami grupe koja zadivljuje mnogim, nama još malo poznatim, origami umjetnicima.

RONALD KOH, Singapur

Ronald Koh, iz Singapura svojim origamijem uspijeva prikazati ranjivu i krhku stranu životinja. Dizajnirao je najprofinjenije zlatne ribice u svijetu origamija.

GORAN KONJEVOD, Hrvatska/SAD

Dr. Goran Konjevod, znanstvenik sa Arizona State University, bavi se origamijem od djetinjstva. 2005. započinje istraživati mogućnosti tenzijskog savijanja i tesselacijskog plisiranja. 2007. izlaže na izložbi origami majstora u Vancouveru, pod vodstvom Josepha Wu, a kao origami umjetnik imao je 2008. i prvu samostalnu izložbu u Phoenixu.

MICHAEL LAFOSSE, SAD

Plodan origami autor i pedagog, izrađuje najfinije origami papire u svijetu, Michael LaFosse pripada rijetkim učenicima Akire Yoshizawe, koji su naslijedili ponešto od majstorovog osjećaja za papir - zajedno sa smislom za jednostavnost.

deg farrelly, USA

University librarian, internationally noted origami artist, deg farrelly has been an active origami folder for more than forty years. Former member of OUSA Board of Directors. Operates the OUSA Lending Library (books by mail service).

TOMOKO FUSE, Japan

Tomoko Fuse, the Grand Dame of origami in Japan today, is the pioneer of geometric and modular folding. She is the author of over fifty origami books. Her delicate and refined boxes motivate even shy beginners to explore further realms of origami.

DRAGUTIN GERIĆ, Croatia

Electrical engineer and origami devotee. Author of the first Croatian origami book, Origami - the art of paper folding. Over 40 years under a spell of paper folding, he is leading a group of origami enthusiasts, giving origami workshops and exhibits.

FERNANDO GILGADO, Spain

Fernando Gilgado, a librarian in Madrid, makes the best origami sharks in the world. He is also the author of nine books of origami.

MIRJANA GOLETIĆ, Croatia

Since 2005 exhibits and runs origami workshops in libraries, schools and open universities. Interested primarily in flowers, she quickly advanced to creating her own models.

NGUYEN HUNG CUONG, Vietnam

Nguyen Hung Cuong, who lives in Ha Noi city, Viet Nam, has been folding creatively for eight years. He is a young representative of the Vietnam origami group of admirable origami artists, scarcely known to our public.

RONALD KOH, Singapore

Ronald Koh, from Singapore, somehow manages to show the vulnerable and fragile side of animals in his origami. He is also the designer of the finest goldfish in the origami world.

GORAN KONJEVOD, Croatia/USA

Dr. Goran Konjevod, scientist at Arizona State University, has been practising origami from his early age. In 2005 started exploring possibilities of tension folding and tessellation pleating. In 2007, he exhibited at Origami Masters in Vancouver, curated by Joseph Wu, and in 2008 had his first solo exhibition as an origami artist in Phoenix.

MICHAEL LAFOSSE, USA

A prolific designer and educator, the maker of the finest origami papers in the world, Michael LaFosse is among the very few students of Yoshizawa to have inherited some of the master's "touch" with paper - along with a sense of simplicity.

BERNARD PEYTON, SAD

Iskustvo dr. Peytona kao istraživača biologa u papir otiskuje životnost i jedinstvenost svake prikazane životinje. Za razliku od većine origami autora, koji rade sa rubom papira, njegova origami umjetnost istražuje zakrivljene površine i nabore iz sredine pāpira. Trenutno radi na novoj origami knjizi, koja se očekuje 2009-2010.

PHILIP SHEN, Hong Kong/SAD 1931-2004

Rođen na Filipinima, dr. Shen je studirao teologiju i bio dekan Chung Chi koledža Kineskog sveučilišta u Hong Kongu. Savijanje papira je započelo u Kini, s otkrićem papira, tvrdio je. Iстicao je vrijednost origamija u interkulturnom razumijevanju i kreativnom izražavanju. Njegove su jednostavne i estetski profinjene origami kreacije izlagane i objavljivane u UK SAD Hong Kongu Japanu, Singapuru.

SANJA SRBLJINOVIC ČUČEK, Hrvatska

Prevoditelj i zaljubljenik origamija, 2005. je pokrenula malu grupu origami entuzijasta i s njima organizirala 13 izložbi i 30 radionica u knjižnicama, školama i učilištima. Od 2007. član Britanskog origami društva. Inicijator i autor prve origami art izložbe u Hrvatskoj, Poezija u papiru.

SAADYA STERNBERG, Izrael

Kipar i filozof iz Beersheve, dr. Sternberg je među origami umjetnicima za pažen po realističnim ljudskim skulpturama i korištenju zakrivljenih nabora. U svom blogu origami-aesthetics.blogspot.com raspravlja o pitanjima origami estetike. Autor je vrlo uspješne izložbe svjetskih origami majstora "Treasures of Origami Art" u muzeju Tikotin, Haifa.

ARNOLD TUBIS, SAD

Umirovljeni sveučilišni profesor fizike, dr. Tubis je napisao četiri origami knjige. Zanimaju ga složeniji modeli koji se mogu efikasno koristiti u osnovnom matematičkom obrazovanju. Njegovi su modeli bili izlagani na svjetskim origami izložbama u SAD, Japanu, Europi i Izraelu.

DAVOR VINKO, Hrvatska

Davor Vinko je asistent na Elektrotehničkom fakultetu Osijek. Kao tinejdžer origami je savladavao uz pomoć knjiga i Interneta. Njegov nedavno oživljeni interes za origami našao je odjek u stvaranju vlastitih modela.

JOSEPH WU, Kanada

Vodeći svjetski profesionalni origami dizajner, u svojim djelima umije kombinirati čistoću i složenost. Autor je sjajne izložbe svjetskih origami majstora u Pendulum galeriji, Vancouver.

BERNARD PEYTON, USA

Dr. Peyton's experience as a wildlife biologist permeates the paper with life and uniqueness of each presented animal. Unlike most origami designers working on the paper edge, his origami art explores curved surfaces and folds from the middle of the paper. He is currently working on a new origami book, to be published in 2009-2010.

PHILIP SHEN, Hong Kong/USA 1931-2004

Born in Philippines, Dr. Shen studied Divinity and was the head of Chung Chi College, Chinese University of Hong Kong. He claimed paper folding began in China, as did the art of papermaking. He emphasized origami as a valuable medium for intercultural understanding and creative expression. His simple and aesthetically refined origami creations were exhibited and published in UK, USA, Hong Kong , Japan and Singapore.

SANJA SRBLJINOVIC ČUČEK, Croatia

Translator and origami devotee, in 2005 Sanja initiated a small group of origami enthusiasts who organised 13 exhibitions and 30 workshops in libraries schools and open universities. Since 2007 member of the British Origami Society. Initiator and author of Poetry in Paper, the first origami art exhibition in Croatia.

SAADYA STERNBERG, Israel

The figure sculptor and philosopher from Beersheva, Dr. Sternberg is noted among origami artists for his realistic human figures and use of curved folds. In his origami-aesthetics.blogspot.com he discusses issues of origami aesthetics. He was curating the highly successful exhibition of international origami masters "Treasures of Origami Art" in Tikotin museum, Haifa.

ARNOLD TUBIS, USA

A retired professor of physics, Dr. Tubis is the author of four origami books. He is interested in intermediate-level models that can be used effectively in basic mathematics education. His models have been exhibited in the USA, Japan, Europe, and Israel.

DAVOR VINKO, Croatia

Davor Vinko is teaching at the Faculty of Electrical Engineering in Osijek. As a teenager learned origami from books and Internet. He recently revived his interest in origami and started creating his own models.

JOSEPH WU, Canada

The leading international origami design professional, Joseph Wu, is able to combine "cleanliness" with complexity in his work. He curated the dazzling exhibition of international origami masters in Pendulum Gallery, Vancouver.

ORIGAMISTI

ALEKSANDRA BLÄTTLER, Hrvatska/Švicarska

Zapaženi ilustrator dječjih knjiga, Aleksandra je origami entuzijast od djetinjstva. Od 2005. Origami izlaže u knjižnicama, školama i učilištima. Voli izazov složenih modela.

ROSANA COHEN, Izrael

Rosana Cohen je origamist iznimnog umijeća, u svijetu zapažena po profijenoj interpretaciji radova isključivo jedne autorice i jednog žanra: modularnog origami Tomoko Fuse.

VESNA HORVAT, Hrvatska

Kao radni terapeut, Vesna Horvat promovira origami kao terapeutsku metodu. Njen omiljeni origami autor je Lew Rozelle. Izlaže origami u klubovima i knjižnicama.

ANA KUPREŠANIN, Hrvatska/SAD

Ana Kuprešanin radi u nastavi i statističkim istraživanjima. U slobodno vrijeme radi skulpture u betonu, metalu i papiru. Njeni origami radovi pokazuju istančani senzibilitet i točnost.

KREŠIMIR RAJKI, Hrvatska

Origami entuzijast iz Zagreba, izlaže u klubovima i knjižnicama u Varaždinu i Zagrebu 2005. Idejni je začetnik projekta "1000 ždralova iz Hrvatske za Hirošimu" u sklopu djelovanja Hrvatsko-Japansko kulturnog i gospodarskog društva.

BOAZ SHUVAL, Izrael/SAD

Inženjer elektrotehnike, trenutačno radi u SAD. Zajubljenik origamija koji za časopis Britanskog origami društva, redovito piše o origami događanjima širom svijeta. Intervjuira vodeće origami umjetnike i crta dijagrame za vlastite modele i modele drugih autora.

FOLDERS

ALEKSANDRA BLÄTTLER, Croatia/Switzerland

A noted illustrator of children's books, Aleksandra has been origami enthusiast from her early age. Since 2005 exhibits origami in libraries, schools and open universities. She delights in folding challenging models

ROSANA COHEN, Israel

Rosana Cohen is a folder of considerable craftsmanship, internationally noted for her delicate interpretation of the work of one designer and one genre within it: the modular origami of Tomoko Fuse.

VESNA HORVAT, Croatia

As a work therapist and origami enthusiast, Vesna Horvat promotes origami as a therapeutic method. Her favourite author is Lew Rozelle. She exhibits origami in clubs and libraries

ANA KUPREŠANIN, Croatia/USA

Ana Kuprešanin teaches and does research in statistics for a living. In her free time, she sculpts in concrete, metal and paper. Her origami folds show delicate sensibility and accuracy.

KREŠIMIR RAJKI, Croatia

Origami enthusiast from Zagreb exhibiting in clubs and libraries in Zagreb and Varaždin. In 2005 initiated project "Thousand Cranes from Croatia for Hiroshima" within the activities of the Croatian-Japanese Cultural And Economic Society

BOAZ SHUVAL, Israel/USA

An electrical engineer presently working in the USA. Origami devotee, contributing regularly to British Origami magazine. Travelling around the world and covering origami events, he writes memorable interviews with prominent origami artists and diagrams his own as well as other artists' models.

