

- 1, TITLE: Hyperparameter optimization in black-box image processing using differentiable proxies
<https://doi.org/10.1145/3306346.3322996>
AUTHORS: Ethan Tseng, Felix Yu, Yuting Yang, Fahim Mannan, Karl ST. Arnaud, Derek Nowrouzezahrai, Jean-François Lalonde, Felix Heide
HIGHLIGHT: We present a fully automatic system to optimize the parameters of black-box hardware and software image processing pipelines according to any arbitrary (i.e., application-specific) metric.
- 2, TITLE: Handheld multi-frame super-resolution
<https://doi.org/10.1145/3306346.3323024>
AUTHORS: Bartłomiej Wronski, Ignacio Garcia-Dorado, Manfred Ernst, Damien Kelly, Michael Krainin, Chia-Kai Liang, Marc Levoy, Peyman Milanfar
HIGHLIGHT: In this paper, we supplant the use of traditional demosaicing in single-frame and burst photography pipelines with a multiframe super-resolution algorithm that creates a complete RGB image directly from a burst of CFA raw images.
- 3, TITLE: Local light field fusion: practical view synthesis with prescriptive sampling guidelines
<https://doi.org/10.1145/3306346.3322980>
AUTHORS: Ben Mildenhall, Pratul P. Srinivasan, Rodrigo Ortiz-Cayon, Nima Khademi Kalantari, Ravi Ramamoorthi, Ren Ng, Abhishek Kar
HIGHLIGHT: We present a practical and robust deep learning solution for capturing and rendering novel views of complex real world scenes for virtual exploration.
- 4, TITLE: Synthetic defocus and look-ahead autofocus for casual videography
<https://doi.org/10.1145/3306346.3323015>
AUTHORS: Xuaner Zhang, Kevin Matzen, Vivien Nguyen, Dillon Yao, You Zhang, Ren Ng
HIGHLIGHT: We present a system that synthetically renders refocusable video from a deep DOF video shot with a smartphone, and analyzes future video frames to deliver context-aware autofocus for the current frame.
- 5, TITLE: Visual smoothness of polyhedral surfaces
<https://doi.org/10.1145/3306346.3322975>
AUTHORS: Davide Pellis, Martin Kilian, Felix Dellinger, Johannes Wallner, Helmut Pottmann
HIGHLIGHT: In this paper we discuss what exactly is meant by a good representation of saddle points, and how this requirement is stronger than a good approximation of a surface plus its normals.
- 6, TITLE: Progressive embedding
<https://doi.org/10.1145/3306346.3323012>
AUTHORS: Hanxiao Shen, Zhongshi Jiang, Denis Zorin, Daniele Panozzo
HIGHLIGHT: By combining our robust embedding with a variant of the matchmaker algorithm, we propose a general algorithm for the problem of mapping multiply connected domains with arbitrary hard constraints to the plane, with applications in texture mapping and remeshing.
- 7, TITLE: Atlas refinement with bounded packing efficiency
<https://doi.org/10.1145/3306346.3323001>
AUTHORS: Hao-Yu Liu, Xiao-Ming Fu, Chunyang Ye, Shuangming Chai, Ligang Liu
HIGHLIGHT: We present a novel algorithm to refine an input atlas with bounded packing efficiency.
- 8, TITLE: Weaving geodesic foliations
<https://doi.org/10.1145/3306346.3323043>
AUTHORS: Josh Vekhter, Jiacheng Zhuo, Luisa F Gil Fandino, Qixing Huang, Etienne Vouga
HIGHLIGHT: Our key insight is a relaxation of vector field integrability in the discrete setting, which allows us to optimize for curl-free unit vector fields that remain well-defined near singularities and robustly recover a scalar function whose gradient is well aligned to these fields.
- 9, TITLE: Gaussian-product subdivision surfaces
<https://doi.org/10.1145/3306346.3323026>
AUTHORS: Reinhold Preiner, Tamy Boubekeur, Michael Wimmer
HIGHLIGHT: We introduce a new surface model that utilizes these qualities of Gaussian mixtures for the definition and control of a parametric smooth surface.
- 10, TITLE: Hierarchical russian roulette for vertex connections
<https://doi.org/10.1145/3306346.3323018>
AUTHORS: Yusuke Tokuyoshi, Takahiro Harada

HIGHLIGHT: To improve the efficiency for such light path configurations, we propose a hierarchical Russian roulette technique for vertex connections.

11, **TITLE:** Optimal multiple importance sampling

<https://doi.org/10.1145/3306346.3323009>

AUTHORS: Ivo Kondapaneni, Petr Vevoda, Pascal Grittmann, Tom? Skrivan, Philipp Slusallek, Jaroslav Kriv?nek

HIGHLIGHT: We apply the new optimal weights to integration problems in light transport and show that they allow for new design considerations when choosing the appropriate sampling techniques for a given integration problem.

12, **TITLE:** Ellipsoidal path connections for time-gated rendering

<https://doi.org/10.1145/3306346.3323016>

AUTHORS: Adithya Pediredla, Ashok Veeraraghavan, Ioannis Gkioulekas

HIGHLIGHT: We take steps towards addressing these deficiencies, by introducing a procedure for efficiently sampling paths with a predetermined length, and incorporating it within rendering frameworks tailored towards simulating time-gated imaging.

13, **TITLE:** A Monte Carlo framework for rendering speckle statistics in scattering media

<https://doi.org/10.1145/3306346.3322950>

AUTHORS: Chen Bar, Marina Alterman, Ioannis Gkioulekas, Anat Levin

HIGHLIGHT: We present a Monte Carlo rendering framework for the physically-accurate simulation of speckle patterns arising from volumetric scattering of coherent waves.

14, **TITLE:** Rodent: generating renderers without writing a generator

<https://doi.org/10.1145/3306346.3322955>

AUTHORS: Ars?ne P?rard-Gayot, Richard Membarth, Roland Lei?a, Sebastian Hack, Philipp Slusallek

HIGHLIGHT: In this paper, we present a framework that allows generating entire renderers for CPUs and GPUs without having to write a dedicated compiler: First, we provide a rendering library in a functional/imperative language that elegantly abstracts the individual rendering concepts using higher-order functions. Second, we use partial evaluation to combine and specialize the individual components of a renderer according to a particular scene.

15, **TITLE:** Interactive hand pose estimation using a stretch-sensing soft glove

<https://doi.org/10.1145/3306346.3322957>

AUTHORS: Oliver Glauser, Shihao Wu, Daniele Panozzo, Otmar Hilliges, Olga Sorkine-Hornung

HIGHLIGHT: We propose a stretch-sensing soft glove to interactively capture hand poses with high accuracy and without requiring an external optical setup.

16, **TITLE:** Learning to fly: computational controller design for hybrid UAVs with reinforcement learning

<https://doi.org/10.1145/3306346.3322940>

AUTHORS: Jie Xu, Tao Du, Michael Foshey, Beichen Li, Bo Zhu, Adriana Schulz, Wojciech Matusik

HIGHLIGHT: In this paper, we propose a method to automate this design process by training a mode-free, model-agnostic neural network controller for hybrid UAVs.

17, **TITLE:** Designing chain reaction contraptions from causal graphs

<https://doi.org/10.1145/3306346.3322977>

AUTHORS: Robin Roussel, Marie-Paule Cani, Jean-Claude L?on, Niloy J. Mitra

HIGHLIGHT: We present a computational framework to help design the layout of such contraptions by optimizing their robustness to possible assembly errors.

18, **TITLE:** A null-scattering path integral formulation of light transport

<https://doi.org/10.1145/3306346.3323025>

AUTHORS: Bailey Miller, Iliyan Georgiev, Wojciech Jarosz

HIGHLIGHT: We build off this generalized RTE to derive a path integral formulation of null scattering, which reveals the sampling pdfs and allows us to devise new, express existing, and combine complementary unbiased techniques via MIS.

19, **TITLE:** Fractional gaussian fields for modeling and rendering of spatially-correlated media

<https://doi.org/10.1145/3306346.3323031>

AUTHORS: Jie Guo, Yanjun Chen, Bingyang Hu, Ling-Qi Yan, Yanwen Guo, Yuntao Liu

HIGHLIGHT: In this paper, we propose a general, physically-based method for modeling such correlated media with non-exponential decay of transmittance.

20, **TITLE:** Photon surfaces for robust, unbiased volumetric density estimation

<https://doi.org/10.1145/3306346.3323041>

AUTHORS: Xi Deng, Shaojie Jiao, Benedikt Bitterli, Wojciech Jarosz

HIGHLIGHT: Our key insight is that we can eliminate the delta kernel and make Monte Carlo estimation practical by integrating any three dimensions analytically, and integrating only the remaining dimensions using Monte Carlo.

21, TITLE: Creating impactful characters: correcting human impact accelerations using high rate IMUs in dynamic activities

<https://doi.org/10.1145/3306346.3322978>

AUTHORS: Calvin Kuo, Ziheng Liang, Ye Fan, Jean-S?bastien Blouin, Dinesh K. Pai

HIGHLIGHT: Here we present a method for correcting motion capture trajectories using a sparse set of inertial measurement units (IMUs) collecting at high sampling rates to produce more accurate impact accelerations without sacrificing accuracy of the generalized coordinates representing gross motions.

22, TITLE: InteractionFusion: real-time reconstruction of hand poses and deformable objects in hand-object interactions

<https://doi.org/10.1145/3306346.3322958>

AUTHORS: Hao Zhang, Zi-Hao Bo, Jun-Hai Yong, Feng Xu

HIGHLIGHT: With this information, a unified optimization framework is proposed to jointly track the hand poses and object motions.

23, TITLE: Real-time pose and shape reconstruction of two interacting hands with a single depth camera

<https://doi.org/10.1145/3306346.3322958>

AUTHORS: Franziska Mueller, Micah Davis, Florian Bernard, Oleksandr Sotnychenko, Mickeal Verschoor, Miguel A. Otaduy, Dan Casas, Christian Theobalt

HIGHLIGHT: We present a novel method for real-time pose and shape reconstruction of two strongly interacting hands.

24, TITLE: Accurate markerless jaw tracking for facial performance capture

<https://doi.org/10.1145/3306346.3323044>

AUTHORS: Gaspard Zoss, Thabo Beeler, Markus Gross, Derek Bradley

HIGHLIGHT: We present the first method to accurately track the invisible jaw based solely on the visible skin surface, without the need for any markers or augmentation of the actor.

25, TITLE: Parametrization quantization with free boundaries for trimmed quad meshing

<https://doi.org/10.1145/3306346.3323019>

AUTHORS: Max Lyon, Marcel Campen, David Bommes, Leif Kobbelt

HIGHLIGHT: We thus present a technique to robustly generate integer grid maps which are either boundary-aligned, non-boundary-aligned, or partially boundary-aligned, just as required by different applications.

26, TITLE: TriWild: robust triangulation with curve constraints

<https://doi.org/10.1145/3306346.3323011>

AUTHORS: Yixin Hu, Teseo Schneider, Xifeng Gao, Qingnan Zhou, Alec Jacobson, Denis Zorin, Daniele Panozzo

HIGHLIGHT: We propose a robust 2D meshing algorithm, TriWild, to generate curved triangles reproducing smooth feature curves, leading to coarse meshes designed to match the simulation requirements necessary by applications and avoiding the geometrical errors introduced by linear meshes.

27, TITLE: Finding hexahedrizations for small quadrangulations of the sphere

<https://doi.org/10.1145/3306346.3323017>

AUTHORS: Kilian Verhetsel, Jeanne Pellerin, Jean-Fran?ois Remacle

HIGHLIGHT: The algorithm proposed in this paper is dedicated to building combinatorial hexahedral meshes of small quadrangulations and ignores the geometrical problem.

28, TITLE: Harmonic triangulations

<https://doi.org/10.1145/3306346.3322986>

AUTHORS: Marc Alexa

HIGHLIGHT: We introduce the notion of harmonic triangulations: a harmonic triangulation simultaneously minimizes the Dirichlet energy of all piecewise linear functions.

29, TITLE: Navigating intrinsic triangulations

<https://doi.org/10.1145/3306346.3322979>

AUTHORS: Nicholas Sharp, Yousuf Soliman, Keenan Crane

HIGHLIGHT: We present a data structure that makes it easy to run a large class of algorithms from computational geometry and scientific computing on extremely poor-quality surface meshes.

- 30, TITLE: Beyond trilinear interpolation: higher quality for free
<https://doi.org/10.1145/3306346.3323032>
AUTHORS: Bal?zs Cs?bfalvi
HIGHLIGHT: In this paper, for the first time, we show that the six additional samples can be used not just for gradient estimation, but for significantly improving the quality of the function reconstruction as well.
- 31, TITLE: Procedural phasor noise
<https://doi.org/10.1145/3306346.3322990>
AUTHORS: Thibault Tricard, Semyon Efremov, C?dric Zanni, Fabrice Neyret, Jon?s Mart?nez, Sylvain Lefebvre
HIGHLIGHT: We propose a novel procedural pattern synthesis technique that exhibits desirable properties for modeling highly contrasted patterns, that are especially well suited to produce surface and microstructure details.
- 32, TITLE: TileGAN: synthesis of large-scale non-homogeneous textures
<https://doi.org/10.1145/3306346.3322993>
AUTHORS: Anna Fr?hst?ck, Ibraheem Alhashim, Peter Wonka
HIGHLIGHT: We build on recent generative adversarial networks and propose two extensions in this paper.
- 33, TITLE: Semantic photo manipulation with a generative image prior
<https://doi.org/10.1145/3306346.3323023>
AUTHORS: David Bau, Hendrik Strobelt, William Peebles, Jonas Wulff, Bolei Zhou, Jun-Yan Zhu, Antonio Torralba
HIGHLIGHT: In this paper, we address these issues by adapting the image prior learned by GANs to image statistics of an individual image.
- 34, TITLE: The face of art: landmark detection and geometric style in portraits
<https://doi.org/10.1145/3306346.3322984>
AUTHORS: Jordan Yaniv, Yael Newman, Ariel Shamir
HIGHLIGHT: We propose a method for artistic augmentation of natural face images that enables training deep neural networks for landmark detection in artistic portraits.
- 35, TITLE: Distortion-free wide-angle portraits on camera phones
<https://doi.org/10.1145/3306346.3322948>
AUTHORS: YiChang Shih, Wei-Sheng Lai, Chia-Kai Liang
HIGHLIGHT: This paper introduces a new algorithm to undistort faces without affecting other parts of the photo.
- 36, TITLE: Wallpaper pattern alignment along garment seams
<https://doi.org/10.1145/3306346.3322991>
AUTHORS: Katja Wolff, Olga Sorkine-Hornung
HIGHLIGHT: We present an interactive algorithm for automatically aligning repetitive textile patterns along seams for a given garment, allowing a user to make design choices at each step of our pipeline.
- 37, TITLE: Visual knitting machine programming
<https://doi.org/10.1145/3306346.3322995>
AUTHORS: Vidya Narayanan, Kui Wu, Cem Yuksel, James McCann
HIGHLIGHT: We present the first general visual programming interface for creating 3D objects with complex surface finishes on industrial knitting machines.
- 38, TITLE: Computational peeling art design
<https://doi.org/10.1145/3306346.3323000>
AUTHORS: Hao Liu, Xiao-Teng Zhang, Xiao-Ming Fu, Zhi-Chao Dong, Ligang Liu
HIGHLIGHT: To this end, we present a computational method for citrus peeling art designs.
- 39, TITLE: Neural volumes: learning dynamic renderable volumes from images
<https://doi.org/10.1145/3306346.3323020>
AUTHORS: Stephen Lombardi, Tomas Simon, Jason Saragih, Gabriel Schwartz, Andreas Lehrmann, Yaser Sheikh
HIGHLIGHT: We circumvent these difficulties by presenting a learning-based approach to representing dynamic objects inspired by the integral projection model used in tomographic imaging.
- 40, TITLE: Deferred neural rendering: image synthesis using neural textures

<https://doi.org/10.1145/3306346.3323035>

AUTHORS: Justus Thies, Michael Zollh?fer, Matthias Nie?ner

HIGHLIGHT: In this work, we explore the use of imperfect 3D content, for instance, obtained from photo-metric reconstructions with noisy and incomplete surface geometry, while still aiming to produce photo-realistic (re-)renderings.

41, TITLE: VR facial animation via multiview image translation

<https://doi.org/10.1145/3306346.3323030>

AUTHORS: Shih-En Wei, Jason Saragih, Tomas Simon, Adam W. Harley, Stephen Lombardi, Michal Perdoch, Alexander Hypes, Dawei Wang, Hernan Badino, Yaser Sheikh

HIGHLIGHT: In this work, we present a bidirectional system that can animate avatar heads of both users' full likeness using consumer-friendly headset mounted cameras (HMC).

42, TITLE: Text-based editing of talking-head video

<https://doi.org/10.1145/3306346.3323028>

AUTHORS: Ohad Fried, Ayush Tewari, Michael Zollh?fer, Adam Finkelstein, Eli Shechtman, Dan B Goldman, Kyle Genova, Zeyu Jin, Christian Theobalt, Maneesh Agrawala

HIGHLIGHT: We propose a novel method to edit talking-head video based on its transcript to produce a realistic output video in which the dialogue of the speaker has been modified, while maintaining a seamless audio-visual flow (i.e. no jump cuts).

43, TITLE: Anisotropic elasticity for inversion-safety and element rehabilitation

<https://doi.org/10.1145/3306346.3323014>

AUTHORS: Theodore Kim, Fernando De Goes, Hayley Iben

HIGHLIGHT: We present an analysis of anisotropic hyperelasticity, specifically transverse isotropy, that obtains closed-form expressions for the eigendecompositions of many common energies.

44, TITLE: Decomposed optimization time integrator for large-step elastodynamics

<https://doi.org/10.1145/3306346.3322951>

AUTHORS: Minchen Li, Ming Gao, Timothy Langlois, Chenfanfu Jiang, Danny M. Kaufman

HIGHLIGHT: Towards addressing these needs we present the Decomposed Optimization Time Integrator (DOT), a new domain-decomposed optimization method for solving the per time step, nonlinear problems of implicit numerical time integration.

45, TITLE: Affine interpolation in a lie group framework

<https://doi.org/10.1145/3306346.3322997>

AUTHORS: Sumukh Bansal, Aditya Tatu

HIGHLIGHT: In this work, we propose an interpolation framework which is based on a Lie group representation of the affine transformation.

46, TITLE: Synthesis of biologically realistic human motion using joint torque actuation

<https://doi.org/10.1145/3306346.3322966>

AUTHORS: Yifeng Jiang, Tom Van Wouwe, Friedl De Groote, C. Karen Liu

HIGHLIGHT: This paper introduces a technique to transform an optimal control problem formulated in the muscle-actuation space to an equivalent problem in the joint-actuation space, such that the solutions to both problems have the same optimal value.

47, TITLE: Scalable muscle-actuated human simulation and control

<https://doi.org/10.1145/3306346.3322972>

AUTHORS: Seunghwan Lee, Moonseok Park, Kyoungmin Lee, Jehhee Lee

HIGHLIGHT: This work aims to build a comprehensive musculoskeletal model and its control system that reproduces realistic human movements driven by muscle contraction dynamics.

48, TITLE: Physics-based full-body soccer motion control for dribbling and shooting

<https://doi.org/10.1145/3306346.3322963>

AUTHORS: Seokpyo Hong, Daseong Han, Kyungmin Cho, Joseph S. Shin, Junyong Noh

HIGHLIGHT: In this paper, we present a novel motion control system that produces physically-correct full-body soccer motions: dribbling forward, dribbling to the side, and shooting, in response to an online user motion prescription specified by a motion type, a running speed, and a turning angle.

49, TITLE: Learning character-agnostic motion for motion retargeting in 2D

<https://doi.org/10.1145/3306346.3322999>

AUTHORS: Kfir Aberman, Rundi Wu, Dani Lischinski, Baoquan Chen, Daniel Cohen-Or

HIGHLIGHT: In this paper, we present a new method for retargeting video-captured motion between different human performers, without the need to explicitly reconstruct 3D poses and/or camera parameters.

- 50, TITLE: Deep view synthesis from sparse photometric images
<https://doi.org/10.1145/3306346.3323007>
AUTHORS: Zexiang Xu, Sai Bi, Kalyan Sunkavalli, Sunil Hadap, Hao Su, Ravi Ramamoorthi
HIGHLIGHT: In this paper, we synthesize novel viewpoints across a wide range of viewing directions (covering a 60° cone) from a sparse set of just six viewing directions.
- 51, TITLE: Deep reflectance fields: high-quality facial reflectance field inference from color gradient illumination
<https://doi.org/10.1145/3306346.3323027>
AUTHORS: Abhimitra Meka, Christian H?ne, Rohit Pandey, Michael Zollh?fer, Sean Fanello, Graham Fyffe, Adarsh Kowdle, Xueming Yu, Jay Busch, Jason Dourgarian, Peter Denny, Sofien Bouaziz, Peter Lincoln, Matt Whalen, Geoff Harvey, Jonathan Taylor, Shahram Izadi, Andrea Tagliasacchi, Paul Debevec, Christian Theobalt, Julien Valentin, Christoph Rhemann
HIGHLIGHT: We present a novel technique to relight images of human faces by learning a model of facial reflectance from a database of 4D reflectance field data of several subjects in a variety of expressions and viewpoints.
- 52, TITLE: Multi-view relighting using a geometry-aware network
<https://doi.org/10.1145/3306346.3323013>
AUTHORS: Julien Philip, Michal?l Gharbi, Tinghui Zhou, Alexei A. Efros, George Drettakis
HIGHLIGHT: We propose the first learning-based algorithm that can relight images in a plausible and controllable manner given multiple views of an outdoor scene.
- 53, TITLE: Single image portrait relighting
<https://doi.org/10.1145/3306346.3323008>
AUTHORS: Tiancheng Sun, Jonathan T. Barron, Yun-Ta Tsai, Zexiang Xu, Xueming Yu, Graham Fyffe, Christoph Rhemann, Jay Busch, Paul Debevec, Ravi Ramamoorthi
HIGHLIGHT: To this end, we present a system for portrait relighting: a neural network that takes as input a single RGB image of a portrait taken with a standard cellphone camera in an unconstrained environment, and from that image produces a relit image of that subject as though it were illuminated according to any provided environment map.
- 54, TITLE: Surface2Volume: surface segmentation conforming assemblable volumetric partition
<https://doi.org/10.1145/3306346.3323004>
AUTHORS: Chrystiano Ara?jo, Daniela Cabiddu, Marco Attene, Marco Livesu, Nicholas Vining, Alla Sheffer
HIGHLIGHT: We propose Surface2Volume, a partition algorithm capable of producing such assemblable parts, each of which is affiliated with a single attribute, the outer surface of whose assembly conforms to the input surface geometry and segmentation.
- 55, TITLE: CurviSlicer: slightly curved slicing for 3-axis printers
<https://doi.org/10.1145/3306346.3323022>
AUTHORS: Jimmy Etienne, Nicolas Ray, Daniele Panozzo, Samuel Hornus, Charlie C. L. Wang, Jon?s Mart?nez, Sara McMains, Marc Alexa, Brian Wyvill, Sylvain Lefebvre
HIGHLIGHT: In this research we exploit the ability of some additive manufacturing processes to deposit material slightly out of plane to dramatically reduce these artifacts.
- 56, TITLE: Star-shaped metrics for mechanical metamaterial design
<https://doi.org/10.1145/3306346.3322989>
AUTHORS: Jon?s Mart?nez, M?lina Skouras, Christian Schumacher, Samuel Hornus, Sylvain Lefebvre, Bernhard Thomaszewski
HIGHLIGHT: We present a method for designing mechanical metamaterials based on the novel concept of Voronoi diagrams induced by star-shaped metrics.
- 57, TITLE: X-Shells: a new class of deployable beam structures
<https://doi.org/10.1145/3306346.3323040>
AUTHORS: J. Panetta, M. Konakovic-Lukovic, F. Isvoranu, E. Bouleau, M. Pauly
HIGHLIGHT: We present X-shells, a new class of deployable structures formed by an ensemble of elastically deforming beams coupled through rotational joints.
- 58, TITLE: Multi-robot collaborative dense scene reconstruction
<https://doi.org/10.1145/3306346.3322942>
AUTHORS: Siyan Dong, Kai Xu, Qiang Zhou, Andrea Tagliasacchi, Shiqing Xin, Matthias Nie?ner, Baoquan Chen
HIGHLIGHT: We present an autonomous scanning approach which allows multiple robots to perform collaborative scanning for dense 3D reconstruction of unknown indoor scenes.

- 59, TITLE: A symmetric objective function for ICP
<https://doi.org/10.1145/3306346.3323037>
AUTHORS: Szymon Rusinkiewicz
HIGHLIGHT: We introduce a new symmetrized objective function that achieves the simplicity and computational efficiency of point-to-plane optimization, while yielding improved convergence speed and a wider convergence basin.
- 60, TITLE: Warp-and-project tomography for rapidly deforming objects
<https://doi.org/10.1145/3306346.3322965>
AUTHORS: Guangming Zang, Ramzi Idoughi, Ran Tao, Gilles Lubineau, Peter Wonka, Wolfgang Heidrich
HIGHLIGHT: In this work we improve the tomographic reconstruction of time-varying geometries undergoing faster, non-periodic deformations.
- 61, TITLE: Symmetric moving frames
<https://doi.org/10.1145/3306346.3323029>
AUTHORS: Etienne Corman, Keenan Crane
HIGHLIGHT: We introduce a fundamentally new representation of such 3D cross fields based on Cartan's method of moving frames.
- 62, TITLE: Optimal transport-based polar interpolation of directional fields
<https://doi.org/10.1145/3306346.3323005>
AUTHORS: Justin Solomon, Amir Vaxman
HIGHLIGHT: We propose an algorithm that interpolates between vector and frame fields on triangulated surfaces, designed to complement field design methods in geometry processing and simulation.
- 63, TITLE: SPOT: sliced partial optimal transport
<https://doi.org/10.1145/3306346.3323021>
AUTHORS: Nicolas Bonneel, David Coeurjolly
HIGHLIGHT: Our paper proposes a fast approach to the optimal transport of constant distributions supported on point sets of different cardinality via one-dimensional slices.
- 64, TITLE: MeshCNN: a network with an edge
<https://doi.org/10.1145/3306346.3322959>
AUTHORS: Rana Hanocka, Amir Hertz, Noa Fish, Raja Giryes, Shachar Fleishman, Daniel Cohen-Or
HIGHLIGHT: In this paper, we utilize the unique properties of the mesh for a direct analysis of 3D shapes using MeshCNN, a convolutional neural network designed specifically for triangular meshes.
- 65, TITLE: SAGNet: structure-aware generative network for 3D-shape modeling
<https://doi.org/10.1145/3306346.3322956>
AUTHORS: Zhijie Wu, Xiang Wang, Di Lin, Dani Lischinski, Daniel Cohen-Or, Hui Huang
HIGHLIGHT: We present SAGNet, a structure-aware generative model for 3D shapes.
- 66, TITLE: iMapper: interaction-guided scene mapping from monocular videos
<https://doi.org/10.1145/3306346.3322961>
AUTHORS: Aron Monszpart, Paul Guerrero, Duygu Ceylan, Ersin Yumer, Niloy J. Mitra
HIGHLIGHT: We present iMapper, a data-driven method to identify such human-object interactions and utilize them to infer layouts of occluded objects.
- 67, TITLE: On the accurate large-scale simulation of ferrofluids
<https://doi.org/10.1145/3306346.3322973>
AUTHORS: Libo Huang, Torsten H^odrich, Dominik L. Michels
HIGHLIGHT: We present an approach to the accurate and efficient large-scale simulation of the complex dynamics of ferrofluids based on physical principles.
- 68, TITLE: An adaptive variational finite difference framework for efficient symmetric otree viscosity
<https://doi.org/10.1145/3306346.3322939>
AUTHORS: Ryan Goldade, Yipeng Wang, Mridul Aanjaneya, Christopher Batty
HIGHLIGHT: We propose an implicit otree finite difference discretization that significantly accelerates the solution of the free surface viscosity equations using adaptive staggered grids, while supporting viscous buckling and rotation effects, variable viscosity, and interaction with scripted moving solids.

69, TITLE: Mixing sauces: a viscosity blending model for shear thinning fluids
<https://doi.org/10.1145/3306346.3322947>
AUTHORS: Kentaro Nagasawa, Takayuki Suzuki, Ryohei Seto, Masato Okada, Yonghao Yue
HIGHLIGHT: We propose a nonlinear blending model that can capture intriguing flowing behaviors that can differ from that of the individual constituents (Fig. 1).

70, TITLE: SurfaceBrush: from virtual reality drawings to manifold surfaces
<https://doi.org/10.1145/3306346.3322970>
AUTHORS: Enrique Rosales, Jafet Rodriguez, ALLA SHEFFER
HIGHLIGHT: We propose SurfaceBrush, a surfacing method that converts such VR drawings into user-intended manifold free-form 3D surfaces, providing a novel approach for modeling 3D shapes.

71, TITLE: Perceptual rasterization for head-mounted display image synthesis
<https://doi.org/10.1145/3306346.3323033>
AUTHORS: Sebastian Friston, Tobias Ritschel, Anthony Steed
HIGHLIGHT: To compensate for latency, we extend the image formation model to directly produce "rolling" images where the time at each pixel depends on its display location.

72, TITLE: Luminance-contrast-aware foveated rendering
<https://doi.org/10.1145/3306346.3322985>
AUTHORS: Okan Tarhan Tursun, Elena Arabadzhyska-Koleva, Marek Wernikowski, Radoslaw Mantiuk, Hans-Peter Seidel, Karol Myszkowski, Piotr Didyk
HIGHLIGHT: In this work, we propose a new luminance-contrast-aware foveated rendering technique which demonstrates that the computational savings of foveated rendering can be significantly improved if local luminance contrast of the image is analyzed.

73, TITLE: Foveated AR: dynamically-foveated augmented reality display
<https://doi.org/10.1145/3306346.3322987>
AUTHORS: Jonghyun Kim, Youngmo Jeong, Michael Stengel, Kaan Aksit, Rachel Albert, Ben Boudaoud, Trey Greer, Joohwan Kim, Ward Lopes, Zander Majercik, Peter Shirley, Josef Spjut, Morgan McGuire, David Luebke
HIGHLIGHT: We present a near-eye augmented reality display with resolution and focal depth dynamically driven by gaze tracking.

74, TITLE: Widgets: modular mechanical widgets for mobile devices
<https://doi.org/10.1145/3306346.3322943>
AUTHORS: Chang Xiao, Karl Bayer, Changxi Zheng, Shree K. Nayar
HIGHLIGHT: We propose a physics-based model to understand the nonlinear mechanical response of widgets.

75, TITLE: Tangent-space optimization for interactive animation control
<https://doi.org/10.1145/3306346.3322938>
AUTHORS: Loïc Ciccone, Cengiz ?ztireli, Robert W. Sumner
HIGHLIGHT: In this paper, we address these problems by formulating the control of interpolations with positional constraints over time as a space-time optimization problem in the tangent space of the animation curves driving the controls.

76, TITLE: Vibration-minimizing motion retargeting for robotic characters
<https://doi.org/10.1145/3306346.3323034>
AUTHORS: Shayan Hoshiyari, Hongyi Xu, Espen Knoop, Stelian Coros, Moritz B?cher
HIGHLIGHT: Our goal is to automatically transfer motions created using traditional animation software to robotic characters while avoiding such artifacts.

77, TITLE: PuppetMaster: robotic animation of marionettes
<https://doi.org/10.1145/3306346.3323003>
AUTHORS: Simon Zimmermann, Roi Poranne, James M. Bern, Stelian Coros
HIGHLIGHT: We present a computational framework for robotic animation of real-world string puppets.

78, TITLE: RedMax: efficient & flexible approach for articulated dynamics
<https://doi.org/10.1145/3306346.3322952>
AUTHORS: Ying Wang, Nicholas J. Weidner, Margaret A. Baxter, Yura Hwang, Danny M. Kaufman, Shinjiro Sueda
HIGHLIGHT: We propose a new approach that is capable of solving the linearly implicit equations of motion in near linear time.

- 79, TITLE: Spectral coarsening of geometric operators
<https://doi.org/10.1145/3306346.3322953>
AUTHORS: Hsueh-Ti Derek Liu, Alec Jacobson, Maks Ovsjanikov
HIGHLIGHT: We introduce a novel approach to measure the behavior of a geometric operator before and after coarsening.
- 80, TITLE: Tensor maps for synchronizing heterogeneous shape collections
<https://doi.org/10.1145/3306346.3322944>
AUTHORS: Qixing Huang, Zhenxiao Liang, Haoyun Wang, Simiao Zuo, Chandrajit Bajaj
HIGHLIGHT: In this paper, we present a multiple map synchronization approach that takes a heterogeneous shape collection as input and simultaneously outputs consistent dense pairwise shape maps.
- 81, TITLE: Stylizing video by example
<https://doi.org/10.1145/3306346.3323006>
AUTHORS: Ondrej Jamriřka, Petr Sochorov, Ondrej Texler, Michal Lukáč, Jakub Fiřer, Jingwan Lu, Eli Shechtman, Daniel Škora
HIGHLIGHT: We introduce a new example-based approach to video stylization, with a focus on preserving the visual quality of the style, user controllability and applicability to arbitrary video.
- 82, TITLE: Interactive and automatic navigation for 360° video playback
<https://doi.org/10.1145/3306346.3323046>
AUTHORS: Kyoungkook Kang, Sunghyun Cho
HIGHLIGHT: In this paper, we propose an interactive and automatic navigation system for comfortable 360° video playback.
- 83, TITLE: Computational design of fabric formwork
<https://doi.org/10.1145/3306346.3322988>
AUTHORS: Xiaoting Zhang, Guoxin Fang, Melina Skouras, Gwenda Gieseler, Charlie C. L. Wang, Emily Whiting
HIGHLIGHT: We present an inverse design tool for fabric formwork - a process where flat panels are sewn together to form a fabric container for casting a plaster sculpture.
- 84, TITLE: Volume-aware design of composite molds
<https://doi.org/10.1145/3306346.3322981>
AUTHORS: Thomas Alderighi, Luigi Malomo, Daniela Giorgi, Bernd Bickel, Paolo Cignoni, Nico Pietroni
HIGHLIGHT: We propose a novel technique for the automatic design of molds to cast highly complex shapes.
- 85, TITLE: Geometry-aware scattering compensation for 3D printing
<https://doi.org/10.1145/3306346.3322992>
AUTHORS: Denis Sumin, Tobias Rittig, Vahid Babaei, Thomas Nindel, Alexander Wilkie, Piotr Didyk, Bernd Bickel, Jaroslav Krivěnek, Karol Myszkowski, Tim Weyrich
HIGHLIGHT: Our method enables high-fidelity color texture reproduction on 3D prints by effectively compensating for internal light scattering within arbitrarily shaped objects.
- 86, TITLE: LayerCode: optical barcodes for 3D printed shapes
<https://doi.org/10.1145/3306346.3322960>
AUTHORS: Henrique Teles Maia, Dingzeyu Li, Yuan Yang, Changxi Zheng
HIGHLIGHT: We introduce an encoding algorithm that enables the 3D printing layers to carry information without altering the object geometry.
- 87, TITLE: Direct delta mush skinning and variants
<https://doi.org/10.1145/3306346.3322982>
AUTHORS: Binh Huy Le, J P Lewis
HIGHLIGHT: This paper introduces Direct Delta Mush, a new algorithm that simultaneously improves on the efficiency and control of Delta Mush while generalizing previous algorithms.
- 88, TITLE: NeuroSkinning: automatic skin binding for production characters with deep graph networks
<https://doi.org/10.1145/3306346.3322969>
AUTHORS: Lijuan Liu, Youyi Zheng, Di Tang, Yi Yuan, Changjie Fan, Kun Zhou
HIGHLIGHT: We present a deep-learning-based method to automatically compute skin weights for skeleton-based deformation of production characters.

89, TITLE: Hand modeling and simulation using stabilized magnetic resonance imaging
<https://doi.org/10.1145/3306346.3322983>
AUTHORS: Bohan Wang, George Matcuk, Jernej Barbic
HIGHLIGHT: We demonstrate how to acquire complete human hand bone anatomy (meshes) in multiple poses using magnetic resonance imaging (MRI).

90, TITLE: Wave-based non-line-of-sight imaging using fast
<https://doi.org/10.1145/3306346.3322937>
AUTHORS: David B. Lindell, Gordon Wetzstein, Matthew O'Toole
HIGHLIGHT: With this work, we introduce a wave-based image formation model for the problem of NLOS imaging.

91, TITLE: Compact snapshot hyperspectral imaging with diffracted rotation
<https://doi.org/10.1145/3306346.3322946>
AUTHORS: Daniel S. Jeon, Seung-Hwan Baek, Shinyoung Yi, Qiang Fu, Xiong Dun, Wolfgang Heidrich, Min H. Kim
HIGHLIGHT: We thereupon present a compact, diffraction-based snapshot hyperspectral imaging method, using only a novel diffractive optical element (DOE) in front of a conventional, bare image sensor.

92, TITLE: Silly rubber: an implicit material point method for simulating non-equilibrated viscoelastic and elastoplastic solids
<https://doi.org/10.1145/3306346.3322968>
AUTHORS: Yu Fang, Minchen Li, Ming Gao, Chenfanfu Jiang
HIGHLIGHT: Drawing inspirations from return mapping based elastoplasticity treatment for granular materials, we present a finite strain integration scheme for general viscoelastic solids under arbitrarily large deformation and non-equilibrated flow.

93, TITLE: CD-MPM: continuum damage material point methods for dynamic fracture animation
<https://doi.org/10.1145/3306346.3322949>
AUTHORS: Joshua Wolper, Yu Fang, Minchen Li, Jiecong Lu, Ming Gao, Chenfanfu Jiang
HIGHLIGHT: We present two new approaches for animating dynamic fracture involving large elastoplastic deformation.

94, TITLE: Implicit untangling: a robust solution for modeling layered clothing
<https://doi.org/10.1145/3306346.3323010>
AUTHORS: Thomas Buffet, Damien Rohmer, Loïc Barthe, Laurence Boissieux, Marie-Paule Cani
HIGHLIGHT: We propose a robust method for untangling an arbitrary number of cloth layers, possibly exhibiting deep interpenetrations, to a collision-free state, ready for animation.

95, TITLE: Learning to optimize halide with tree search and random programs
<https://doi.org/10.1145/3306346.3322967>
AUTHORS: Andrew Adams, Karima Ma, Luke Anderson, Riyadh Baghdadi, Tzu-Mao Li, Michaël Gharbi, Benoit Steiner, Steven Johnson, Kayvon Fatahalian, Frédéric Durand, Jonathan Ragan-Kelley
HIGHLIGHT: We present a new algorithm to automatically schedule Halide programs for high-performance image processing and deep learning.

96, TITLE: KleinPAT: optimal mode conflation for time-domain precomputation of acoustic transfer
<https://doi.org/10.1145/3306346.3322976>
AUTHORS: Jui-Hsien Wang, Doug L. James
HIGHLIGHT: We propose a new modal sound synthesis method that rapidly estimates all acoustic transfer fields of a linear modal vibration model, and greatly reduces preprocessing costs.

97, TITLE: Physically-based statistical simulation of rain sound
<https://doi.org/10.1145/3306346.3323045>
AUTHORS: Shiguang Liu, Haonan Cheng, Yiyang Tong
HIGHLIGHT: In this paper, we present a physically-based statistical simulation method to synthesize realistic rain sound, which respects surface materials.

98, TITLE: Variational implicit point set surfaces
<https://doi.org/10.1145/3306346.3322994>
AUTHORS: Zhiyang Huang, Nathan Carr, Tao Ju
HIGHLIGHT: We propose a new method for reconstructing an implicit surface from an un-oriented point set.

- 99, TITLE: Sample-based Monte Carlo denoising using a kernel-splatting network
<https://doi.org/10.1145/3306346.3322954>
AUTHORS: Micha?l Gharbi, Tzu-Mao Li, Miika Aittala, Jaakko Lehtinen, Fr?do Durand
HIGHLIGHT: We present the first convolutional network that can learn to denoise Monte Carlo renderings directly from the samples.
- 100, TITLE: Deep convolutional reconstruction for gradient-domain rendering
<https://doi.org/10.1145/3306346.3323038>
AUTHORS: Markus Kettunen, Erik H?rk?nen, Jaakko Lehtinen
HIGHLIGHT: Drawing on the power of modern convolutional neural networks, we propose a novel reconstruction method for gradient-domain rendering.
- 101, TITLE: A learned shape-adaptive subsurface scattering model
<https://doi.org/10.1145/3306346.3322974>
AUTHORS: Delio Vicini, Vladlen Koltun, Wenzel Jakob
HIGHLIGHT: This article introduces a new shape-adaptive BSSRDF model that retains the efficiency of prior analytic methods while greatly improving overall accuracy.
- 102, TITLE: Efficient and conservative fluids using bidirectional mapping
<https://doi.org/10.1145/3306346.3322945>
AUTHORS: Ziyin Qu, Xinxin Zhang, Ming Gao, Chenfanfu Jiang, Baoquan Chen
HIGHLIGHT: In this paper, we introduce BiMocq2, an unconditionally stable, pure Eulerianbased advection scheme to efficiently preserve the advection accuracy of all physical quantities for long-term fluid simulations.
- 103, TITLE: On bubble rings and ink chandeliers
<https://doi.org/10.1145/3306346.3322962>
AUTHORS: Marcel Padilla, Albert Chern, Felix Kn?ppel, Ulrich Pinkall, Peter Schr?der
HIGHLIGHT: We introduce variable thickness, viscous vortex filaments.
- 104, TITLE: Fundamental solutions for water wave animation
<https://doi.org/10.1145/3306346.3323002>
AUTHORS: Camille Schreck, Christian Hafner, Chris Wojtan
HIGHLIGHT: Subsequently, we present a novel wavelet-based discretization which outperforms the state of the art MFS approach for simulating time-varying water surface waves with moving obstacles.
- 105, TITLE: Synthetic silviculture: multi-scale modeling of plant ecosystems
<https://doi.org/10.1145/3306346.3323039>
AUTHORS: Milosz Makowski, Torsten H?drich, Jan Scheffczyk, Dominik L. Michels, S?ren Pirk, Wojtek Palubicki
HIGHLIGHT: In this paper we describe a multi-scale method to design large-scale ecosystems with individual plants that are realistically modeled and faithfully capture biological features, such as growth, plant interactions, different types of tropism, and the competition for resources.
- 106, TITLE: PlanIT: planning and instantiating indoor scenes with relation graph and spatial prior networks
<https://doi.org/10.1145/3306346.3322941>
AUTHORS: Kai Wang, Yu-An Lin, Ben Weissmann, Manolis Savva, Angel X. Chang, Daniel Ritchie
HIGHLIGHT: We present a new framework for interior scene synthesis that combines a high-level relation graph representation with spatial prior neural networks.
- 107, TITLE: Content-aware generative modeling of graphic design layouts
<https://doi.org/10.1145/3306346.3322971>
AUTHORS: Xinru Zheng, Xiaotian Qiao, Ying Cao, Rynson W. H. Lau
HIGHLIGHT: In this paper, we study the problem of content-aware graphic design layout generation. To train our model, we build a large-scale magazine layout dataset with fine-grained layout annotations and keyword labeling.
- 108, TITLE: Deep inverse rendering for high-resolution SVBRDF estimation from an arbitrary number of images
<https://doi.org/10.1145/3306346.3323042>
AUTHORS: DUAN GAO, Xiao Li, Yue Dong, Pieter Peers, Kun Xu, Xin Tong
HIGHLIGHT: In this paper we present a unified deep inverse rendering framework for estimating the spatially-varying appearance properties of a planar exemplar from an arbitrary number of input photographs, ranging from just a single photograph to many photographs.

109, TITLE: A similarity measure for material appearance
<https://doi.org/10.1145/3306346.3323036>
AUTHORS: Manuel Lagunas, Sandra Malpica, Ana Serrano, Elena Garces, Diego Gutierrez, Belen Masia
HIGHLIGHT: We present a model to measure the similarity in appearance between different materials, which correlates with human similarity judgments.
We first create a database of 9,000 rendered images depicting objects with varying materials, shape and illumination.

110, TITLE: Using moments to represent bounded signals for spectral rendering
<https://doi.org/10.1145/3306346.3322964>
AUTHORS: Christoph Peters, Sebastian Merzbach, Johannes Hanika, Carsten Dachsbacher
HIGHLIGHT: Instead, we present a novel approach for reconstruction of bounded densities based on the theory of moments.

111, TITLE: Accurate appearance preserving prefiltering for rendering displacement-mapped surfaces
<https://doi.org/10.1145/3306346.3322936>
AUTHORS: Lifan Wu, Shuang Zhao, Ling-Qi Yan, Ravi Ramamoorthi
HIGHLIGHT: In this paper, we introduce a new method that prefilters displacement maps and BRDFs jointly and constructs SVBRDFs at reduced resolutions.