TECHNICAL PAPERS PROGRAM

ART PAPERS PARTICIPANT
Session Chair: Ruth West

- TRANSFORMING THE COMMONPLACE THROUGH MACHINE PERCEPTION: LIGHT FIELD SYNTHESIS AND MUSIC INFORMATION RETRIEVAL IN THE ROVER PROJECT
- AUTOENCODING BLADE RUNNER: RECONSTRUCTING FILMS WITH ARTIFICIAL NEURAL NETWORKS

ROOM 153
TUESDAY, 1 AUGUST
3:45 PM - 5:55 PM

IMAGINATIVE IMAGING
Session Chair: Sylvain Paris

- COLUX: MULTI-OBJECT 3D MICRO-MOTION ANALYSIS USING SPECKLE IMAGING
- 4D IMAGING THROUGH SPRAY-ON OPTICS
- RAINBOW PARTICLE IMAGING VELOCIMETRY FOR DENSE 3D FLUID VELOCITY IMAGING
- EPIPOLAR TIME-OF-FLIGHT IMAGING

ROOM 150/151
MONDAY, 31 JULY
9:00 AM - 10:30 AM

MAPPINGS AND DEFORMATIONS
Session Chair: Ofir Weber

- SCALABLE LOCALLY INJECTIVE MAPPINGS
- GEOMETRIC OPTIMIZATION VIA COMPOSITE MAJORIZATION
- VARIANCE-MINIMIZING TRANSPORT PLANS FOR INTER-SURFACE MAPPING
- REGULARIZED KELVINLETS: SCULPTING BRUSHES BASED ON FUNDAMENTAL SOLUTIONS OF ELASTICITY

ROOM 152
MONDAY, 31 JULY
9:00 AM - 10:30 AM
LEARNING TO MOVE
Session Chair: Karan Sing

- DEEPLoco: Dynamic Locomotion Skills Using Hierarchical Deep Reinforcement Learning
- Phase-Functioned Neural Networks for Character Control
- Learning to Schedule Control Fragments for Physics-Based Characters Using Deep Q-Learning
- Discovering and Synthesizing Humanoid Climbing Movements

Room 153
Monday, 31 July
9:00 AM - 10:30 AM

GET MORE OUT OF YOUR PHOTO
Session Chair: George Drettakis

- VNect: Real-Time 3D Human-Pose Estimation with a Single RGB Camera
- Real-Time Geometry, Albedo, and Motion Reconstruction Using a Single RGBD Camera
- Modeling Surface Appearance from a Single Photograph Using Self-Augmented Convolutional Neural Networks
- Virtual Rephotography: Novel View Prediction Error for 3D Reconstruction
- Computational Zoom: A Framework for Post-Capture Image Composition

Room 150/151
Monday, 31 July
3:45 PM - 5:35 PM

PEOPLE POWER
Session Chair: Eakta Jain

- Movie Editing and Cognitive Event Segmentation in Virtual Reality Video
- Sequential Line Search for Efficient Visual Design Optimization by Crowds
- Perform: Perceptual Approach for Adding Ocean Personality to Human Motion Using Laban Movement Analysis
- Understanding the Impact of Animated Gesture Performance on Personality Perceptions
- Saccade-Landing-Position Prediction for Gaze-Contingent Rendering

Room 152
Monday, 31 July
3:45 PM - 5:35 PM
COMPARING 3D SHAPES AND PARTS
Session Chair : Niloy Mitra

- CO-LOCATING STYLE-DEFINING ELEMENTS ON 3D SHAPES
- DEFORMATION-DRIVEN SHAPE CORRESPONDENCE VIA SHAPE RECOGNITION
- GRASS: GENERATIVE RECURSIVE AUTOENCODERS FOR SHAPE STRUCTURES
- RETRIEVAL ON PARAMETRIC SHAPE COLLECTIONS
- UNDERSTANDING AND EXPLOITING OBJECT INTERACTION LANDSCAPES

ROOM 153
MONDAY, 31 JULY
3:45 PM - 5:35 PM

CLEVER SOLIDS
Session Chair : Adam Bargteil

- EXAMPLE-BASED DAMPING DESIGN
- DATA-DRIVEN PHYSICS FOR HUMAN SOFT-TISSUE ANIMATION
- ROBUST EXTENDED FINITE ELEMENTS FOR COMPLEX CUTTING OF DEFORMABLES
- A MULTI-SCALE MODEL FOR SIMULATING LIQUID-HAIR INTERACTIONS

ROOM 150/151
TUESDAY, 1 AUGUST
9:00 AM - 10:30 AM

BEING DISCRETE ABOUT GEOMETRY PROCESSING
Session Chair : Alec Jacobson

- BOUNDING PROXIES FOR SHAPE APPROXIMATION
- SPATIOTEMPORAL ATLAS PARAMETERIZATION FOR EVOLVING MESHES
- FLOWREP: DESCRIPTIVE CURVE NETWORKS FOR FREE-FORM DESIGN SHAPES
- FUNCTIONAL CHARACTERIZATION OF INTRINSIC AND EXTRINSIC GEOMETRY

ROOM 152
TUESDAY, 1 AUGUST
9:00 AM - 10:30 AM
COLOR & COMPOSING
Session Chair: Ariel Shamir

- CONSTRAINED PALETTE-SPACE EXPLORATION
- PLAYFUL PALETTE: AN INTERACTIVE PARAMETRIC COLOR MIXER FOR ARTISTS
- DECOMPOSING IMAGES INTO LAYERS VIA RGB-SPACE GEOMETRY
- INTERACTIVE HIGH-QUALITY GREEN-SCREEN KEYING VIA COLOR UNMIXING
- UNMIXING-BASED SOFT COLOR SEGMENTATION FOR IMAGE MANIPULATION

ROOM 150/151
TUESDAY, 1 AUGUST
10:45 AM - 12:35 PM

FABRICATING CURVES, SURFACES & VOLUMES
Session Chair: Dave Levin

- COMPUTATIONAL DESIGN AND AUTOMATED FABRICATION OF KIRCHHOFF-PLATEAU SURFACES
- IMAGE-BASED RECONSTRUCTION OF WIRE ART
- CURVEUPS: SHAPING OBJECTS FROM FLAT PLATES WITH TENSION-ACTUATED CURVATURE
- STRING-ACTUATED CURVED FOLDED SURFACES
- OPTIMAL DISCRETE SLICING

ROOM 152
TUESDAY, 1 AUGUST
10:45 AM - 12:35 PM

REFLECTANCE & SCATTERING
Session Chair: Matthias Hullin

- PRACTICAL ACQUISITION AND RENDERING OF DIFFRACTION EFFECTS IN SURFACE REFLECTANCE
- A PRACTICAL EXTENSION TO MICROFACET THEORY FOR MODELING VARYING IRIDESCENCE
- A TWO-SCALE MICROFACET REFLECTANCE MODEL COMBINING REFLECTION AND DIFFRACTION
- AN EFFICIENT AND PRACTICAL NEAR-AND-FAR-FIELD FUR REFLECTANCE MODEL

ROOM 153
TUESDAY, 1 AUGUST
10:45 AM - 12:35 PM
FLUID CONTROL & SYNTHESIS
Session Chair: Chris Wojtan

- EFFICIENT SOLVER FOR SPACETIME CONTROL OF SMOKE
- INTERPOLATIONS OF SMOKE AND LIQUID SIMULATIONS
- DATA-DRIVEN SYNTHESIS OF SMOKE FLOWS WITH CNN-BASED FEATURE DESCRIPTORS
- FLUXED ANIMATED BOUNDARY METHOD

ROOM 150/151
TUESDAY, 1 AUGUST
2:00 PM - 3:30 PM

LEARNING & ANALYSIS FOR GEOMETRY
Session Chair: Justin Solomon

- LEARNING HIERARCHICAL SHAPE SEGMENTATION AND LABELING FROM ONLINE REPOSITORIES
- CONVOLUTIONAL NEURAL NETWORKS ON SURFACES VIA SEAMLESS TORIC COVERS
- O-CNN: OCTREE-BASED CONVOLUTIONAL NEURAL NETWORKS FOR 3D SHAPE ANALYSIS
- CLOTHCAP: SEAMLESS 4D CLOTHING CAPTURE AND RETARGETTING

ROOM 152
TUESDAY, 1 AUGUST
2:00 PM - 3:30 PM

RENDERING IN PATH SPACE
Session Chair: Jaakko Lehtinen

- FUSING STATE SPACES FOR MARKOV CHAIN MONTE CARLO RENDERING
- CHARTED METROPOLIS LIGHT TRANSPORT
- A SPATIAL TARGET FUNCTION FOR METROPOLIS PHOTON TRACING
- ANTIALIASING COMPLEX GLOBAL ILLUMINATION EFFECTS IN PATH-SPACE

ROOM 153
TUESDAY, 1 AUGUST
2:00 PM - 3:30 PM
RECONSTRUCTING 3D SURFACES FROM POINTS, LINES, IMAGES & WATER
Session Chair: Alla Sheffer
- FIELD-ALIGNED ONLINE SURFACE RECONSTRUCTION
- TOPOLOGY-CONTROLLED RECONSTRUCTION OF MULTI-LABELLED DOMAINS FROM CROSS-SECTIONS
- BUNDLEFUSION: REAL-TIME GLOBALLY CONSISTENT 3D RECONSTRUCTION USING ON-THE-FLY SURFACE RE-INTEGRATION
- TANKS AND TEMPLES: BENCHMARKING LARGE-SCALE SCENE RECONSTRUCTION
- DIP TRANSFORM FOR 3D SHAPE RECONSTRUCTION

ROOM 150/151
TUESDAY, 1 AUGUST
3:45 PM - 5:35 PM

DYNAMIC FABRICATION
Session Chair: Takeo Igarashi
- INTERACTIVE DESIGN OF ANIMATED PLUSHIES
- FUNCTIONALITY AWARE RETARGETING OF MECHANISMS TO 3D SHAPES
- A COMPUTATIONAL DESIGN TOOL FOR COMPLIANT MECHANISMS
- COMPUTATIONAL DESIGN OF TELESCOPING STRUCTURES
- DYNAMICS-AWARE COARSENING FOR FABRICATION DESIGN

ROOM 152
TUESDAY, 1 AUGUST
3:45 PM - 5:35 PM

TIME TO FOCUS
Session Chair: Elmar Eisemann
- HOLOGRAPHIC NEAR-EYE DISPLAYS FOR VIRTUAL AND AUGMENTED REALITY
- FOCAL SURFACE DISPLAYS
- ACCOMMODATION AND COMFORT IN HEAD-MOUNTED DISPLAYS
- ACCOMMODATION-INVARIANT COMPUTATIONAL NEAR-EYE DISPLAYS

ROOM 150/151
WEDNESDAY, 2 AUGUST
9:00 AM - 10:30 AM
GLOBAL PARAMETERIZATION
Session Chair: Fernando de Goes

- HARMONIC GLOBAL PARAMETRIZATION WITH RATIONAL HOLONYM
- SPHERICAL ORBIFOLD TUTTE EMBEDDINGS
- SIMILARITY MAPS AND FIELD-GUIDED T-SPLINES: A PERFECT COUPLE
- CONSISTENT FUNCTIONAL CROSS-FIELD DESIGN FOR MESH QUADRANGULATION

ROOM 152
WEDNESDAY, 2 AUGUST
9:00 AM - 10:30 AM

SPEECH AND FACIAL ANIMATION
Session Chair: Nikunj Raghuvanshi

- A DEEP LEARNING APPROACH FOR GENERALIZED SPEECH ANIMATION
- AUDIO-DRIVEN FACIAL ANIMATION BY JOINT END-TO-END LEARNING OF POSE AND EMOTION
- SYNTHESIZING OBAMA: LEARNING LIP SYNC FROM AUDIO
- VOICO: TEXT-BASED INSERTION AND REPLACEMENT IN AUDIO NARRATION

ROOM 153
WEDNESDAY, 2 AUGUST
9:00 AM - 10:30 AM

RENDERING SYSTEMS
Session Chair: Toshiya Hachisuka

- KERNEL-PREDICTING CONVOLUTIONAL NETWORKS FOR DENOISING MONTE CARLO RENDERINGS
- INTERACTIVE RECONSTRUCTION OF MONTE CARLO IMAGE SEQUENCES USING A RECURRENT DENOISING AUTOENCODER

ROOM 150/151
WEDNESDAY, 2 AUGUST
10:45 AM - 12:35 PM
FLUIDS II
Session Chair: Tamar Shinar

- VARIATIONAL STOKES: A UNIFIED PRESSURE-VISCOSITY SOLVER FOR ACCURATE VISCOUS LIQUIDS
  - INFINITE CONTINUOUS ADAPTIVITY FOR INCOMPRESSIBLE SPH
  - WATER WAVE PACKETS
  - MULTI-SCALE VORTICLE FLUIDS
  - MULTI-SPECIES SIMULATION OF POROUS SAND AND WATER MIXTURES

ROOM 152
WEDNESDAY, 2 AUGUST
10:45 AM - 12:35 PM

IMAGE TEXTURE & COMPLETION
Session Chair: Maneesh Agrawala

- PROGRAMMABLE 2D ARRANGEMENTS FOR ELEMENT TEXTURE DESIGN
- DEEP CORRELATIONS FOR TEXTURE SYNTHESIS
- PATCH-BASED OPTIMIZATION FOR IMAGE-BASED TEXTURE MAPPING
- GLOBALLY AND LOCALLY CONSISTENT IMAGE COMPLETION
- NAUTILUS: RECOVERING REGIONAL SYMMETRY TRANSFORMATIONS FOR IMAGE EDITING

ROOM 153
WEDNESDAY, 2 AUGUST
10:45 AM - 12:35 PM

RENDERING VOLUMES
Session Chair: Holly Rushmeier

- A FORWARD-SCATTERING DIPOLE MODEL FROM A FUNCTIONAL INTEGRAL APPROXIMATION
- LIGHTING GRID HIERARCHY FOR SELF-ILLUMINATING EXPLOSIONS
- SPECTRAL AND DECOMPOSITION TRACKING FOR RENDERING HETEROGENEOUS VOLUMES
- BEYOND POINTS AND BEAMS: HIGHER-DIMENSIONAL PHOTON SAMPLES FOR VOLUMETRIC LIGHT TRANSPORT

ROOM 150/151
WEDNESDAY, 2 AUGUST
2:00 PM - 3:30 PM
MESHING
Session Chair: Mirela Ben-Chen

- REGULAR MESHES FROM POLYGONAL PATTERNS
- HEXAHEDRAL-DOMINANT MESHING
- ROBUST HEX-DOMINANT MESH GENERATION USING FIELD-GUIDED POLYHEDRAL AGGLOMERATION
- BOUNDARY ELEMENT OCTAHEDRAL FIELDS IN VOLUMES

ROOM 152
WEDNESDAY, 2 AUGUST
2:00 PM - 3:30 PM

SOUND & ELASTICS
Session Chair: Ming Lin

- INTERACTIVE SOUND PROPAGATION AND RENDERING FOR LARGE MULTI-SOURCE SCENES
- ANIMATING ELASTIC RODS WITH SOUND
- A STIFFLY ACCURATE INTEGRATOR FOR ELASTODYNAMIC PROBLEMS
- QUASI-NEWTON METHODS FOR REAL-TIME SIMULATION OF HYPERELASTIC MATERIALS

ROOM 153
WEDNESDAY, 2 AUGUST
2:00 PM - 3:30 PM

DEEP IMAGE PROCESSING
Session Chair: Aaron Hertzmann

- DEEP EXTRACTION OF MANGA STRUCTURAL LINES
- DEEP BILATERAL LEARNING FOR REAL-TIME IMAGE ENHANCEMENT
- REAL-TIME USER-GUIDED IMAGE COLORIZATION WITH LEARNED DEEP PRIORS
- VISUAL ATTRIBUTE TRANSFER THROUGH DEEP IMAGE ANALOGY
- DEEP COMPOSITING USING LIE ALGEBRAS

ROOM 150/151
WEDNESDAY, 2 AUGUST
3:45 PM - 5:35 PM
FABRICATING LOOK & FEEL
Session Chair: Bernhard Thomaszewski

- TWO-SCALE TOPOLOGY OPTIMIZATION WITH MICROSTRUCTURES
- ORTHOTROPIC K-NEAREST FOAMS FOR ADDITIVE MANUFACTURING
- WORST-CASE STRESS RELIEF FOR MICROSTRUCTURES
- PRINTING ANISOTROPIC APPEARANCE WITH MAGNETIC FLAKES
- COLOR CONTONING FOR 3D PRINTING

ROOM 152
WEDNESDAY, 2 AUGUST
3:45 PM - 5:35 PM

SKETCHING & CURVES
Session Chair: Yotam Gingold

- BENDSKETCH: MODELING FREEFORM SURFACES THROUGH 2D SKETCHING
- DEEPSKETCH2FACE: A DEEP-LEARNING-BASED SKETCHING SYSTEM FOR 3D FACE AND CARICATURE MODELING
- EXAMPLE-BASED EXPRESSIVE ANIMATION OF 2D RIGID BODIES
- SKIPPY: SINGLE-VIEW 3D CURVE INTERACTIVE MODELING
- K-CURVES: INTERPOLATION AT LOCAL MAXIMUM CURVATURE

ROOM 153
WEDNESDAY, 2 AUGUST
3:45 PM - 5:35 PM

VIDEO
Session Chair: Kayvon Fatahalian

- TIME-SLICE VIDEO SYNTHESIS BY ROBUST VIDEO ALIGNMENT
- COMPUTATIONAL VIDEO EDITING FOR DIALOGUE-DRIVEN SCENES
- REAL-TIME PLANNING FOR AUTOMATED MULTI-VIEW DRONE CINEMATOGRAPHY
- LIGHT-FIELD VIDEO CAPTURE USING A LEARNING-BASED HYBRID-IMAGING SYSTEM

ROOM 150/151
THURSDAY, 3 AUGUST
9:00 AM - 10:30 AM
SIMULATION FOR VIRTUAL WORLDS
Session Chair: Ken Anjyo

- FAST WEATHER SIMULATION FOR INVERSE PROCEDURAL DESIGN OF 3D URBAN MODELS
- AUTHORING LANDSCAPES BY COMBINING ECOSYSTEM AND TERRAIN-EROSION SIMULATION
- BOTANICAL MATERIALS BASED ON BIOMECHANICS
- IMPLICIT INTEGRATION FOR ROBUST COLLISION-FREE CROWD SIMULATION

ROOM 152
THURSDAY, 3 AUGUST
9:00 AM - 10:30 AM

RANDOM SAMPLING
Session Chair: LiYi Wei

- CONVERGENCE ANALYSIS FOR ANISOTROPIC MONTE CARLO SAMPLING SPECTRA
- WASSERSTEIN BLUE-NOISE SAMPLING
- AN ADAPTIVE POINT SAMPLER ON A REGULAR LATTICE
- A SPHERICAL-CAP-PRESERVING PARAMETERIZATION FOR SPHERICAL DISTRIBUTIONS

ROOM 153
THURSDAY, 3 AUGUST
9:00 AM - 10:30 AM

FLUIDS III
Session Chair: Rahul Narain

- A SCHUR COMPLEMENT PRECONDITIONER FOR SCALABLE PARALLEL FLUID SIMULATION
- POWER DIAGRAMS AND SPARSE PAGED GRIDS FOR HIGH-RESOLUTION ADAPTIVE LIQUIDS
- GENERIC OBJECTIVE VORTICES FOR FLOW VISUALIZATION
- INSIDE FLUIDS: CLEBSCH MAPS FOR VISUALIZATION AND PROCESSING
- PERCEPTUAL EVALUATION OF LIQUID SIMULATION METHODS

ROOM 150/151
THURSDAY, 3 AUGUST
10:45 AM - 12:35 PM
IMAGE AND LIGHT FIELD MANIPULATION
Session Chair: Diego Gutierrez

- Interactive relighting in single low-dynamic-range images
- Non-uniform spatial deformation of light fields by locally linear transformations

TRANSFORMATIONS
- Deep high-dynamic-range imaging of dynamic scenes
- Spectral remapping for image downsampling
- Portrait-lighting transfer using a mass-transport approach

ROOM 152
THURSDAY, 3 AUGUST
10:45 AM - 12:35 PM

HUMAN MOTION
Session Chair: Jehee Lee

- Multi-contact locomotion using a contact graph with feasibility predictors
- Domain of attraction expansion for physics-based character control
- Momentum-mapped inverted pendulum models for controlling dynamic human motions

ROOM 153
THURSDAY, 3 AUGUST
10:45 AM - 11:55 PM

COMPUTATIONAL CAMERAS & DISPLAYS
Session Chair: Gordon Wetzstein

- 3DTV at home: Eulerian-Lagrangian stereo-to-multiview conversion
- Hiding of phase-based stereo disparity for ghost-free viewing without glasses
- Low-cost 360 stereo photography and video capture
- Mixed-primary factorization for dual-frame computational displays

ROOM 150/151
THURSDAY, 3 AUGUST
2:00 PM - 3:30 PM
LET'S GET IN CONTACT
Session Chair: Paul Kry

- BOUNCE MAPS: AN IMPROVED RESTITUTION MODEL FOR REAL-TIME RIGID-BODY IMPACT
- ALL’S WELL THAT ENDS WELL: GUARANTEED RESOLUTION OF SIMULTANEOUS RIGID-BODY IMPACT
- ANISOTROPIC ELASTOPLASTICITY FOR CLOTH, KNIT, AND HAIR FRICTIONAL CONTACT

ROOM 152
THURSDAY, 3 AUGUST
2:00 PM - 3:30 PM

FACES & HAIR
Session Chair: Ira Kemelmacher-Shlizerman

- PHACE: PHYSICS-BASED FACE MODELING AND ANIMATION
- FACIAL RETARGETING WITH AUTOMATIC RANGE-OF-MOTION ALIGNMENT
- EXAMPLE-BASED SYNTHESIS OF STYLIZED FACIAL ANIMATIONS
- A DATA-DRIVEN APPROACH TO FOUR-VIEW IMAGE-BASED HAIR MODELING

ROOM 153
THURSDAY, 3 AUGUST
2:00 PM - 3:30 PM

WORK IT, MAKE IT BETTER, STRONGER
Session Chair: Stelian Coros

- INTERACTIVE DESIGN-SPACE EXPLORATION AND OPTIMIZATION FOR CAD MODELS
- INTERACTIVE DESIGN AND STABILITY ANALYSIS OF DECORATIVE JOINERY FOR FURNITURE
- LIGHTWEIGHT STRUCTURE DESIGN UNDER FORCE-LOCATION UNCERTAINTY
- DESIGN AND VOLUME OPTIMIZATION OF SPACE STRUCTURES

ROOM 150/151
THURSDAY, 3 AUGUST
3:45 PM - 5:15 PM