UNIVERSITY of WASHINGTON

3DV 2013

June 29th-30th, Seattle, WA, USA

Conference Guide

3DV 2013

June 29th-30th, Seattle, WA, USA

Friday June 28th	4:30 - 6:30 PM	Welcome Reception and Happy Hour at Hotel Deca (4507 Brooklyn Ave NE, Seattle)
Saturday June 29th	8:45 - 9:00 AM 9:00 - 10:00 AM 10:00 - 11:00 AM 11:00 - 11:15 AM 11:15 AM - 12:15 PM 12:15 - 1:15 PM 1:15 - 2:30 PM 2:30 - 4:30 PM 4:40 - 5:40 PM	Welcome speech Keynote 1 Oral session 1 Coffee break Oral session 2 Keynote 2 Lunch break Posters/demos 1 Oral session 3
Sunday June 30th	9:00 - 10:00 AM 10:00 - 11:00 AM 11:00 - 11:15 AM 11:15 AM - 12:15 PM 12:15 - 1:15 PM 1:15 - 2:30 PM 2:30 - 4:30 PM 4:40 - 5:40 PM 5:40 - 5:50 PM 7:00 PM - Late	Keynote 3 Oral session 4 Coffee break Keynote 4 Oral session 5 Lunch break Posters/demos 2 Keynote 5 Closing remarks Banquet at Space Needle

WELCOME

Welcome to 3DV 2013! We are excited about this year's broad spectrum of high quality papers in 3D modeling, scanning, transmission and visualization. Together with the keynote talks, these papers will guarantee two exciting days. We are happy to hold 3DV 2013 at University of Washington in Seattle, one of the strongholds of computer vision and computer graphics research.

We received paper submissions for 3DV 2013 from Asia, America, and Europe making it a conference of truly international scope. We selected 15 papers for oral presentation and 41 papers for poster presentation. These selected papers make for a well-balanced program covering all aspects of 3DV.

The conference will start on June 29th, 2013 and will maintain its traditional single-track format. We are very excited with the five keynote presentations from Martin Banks (University of California, Berkeley), Martin Byröd (Apple Maps), Dieter Fox (University of Washington), Vladlen Koltun (Stanford University), and Jamie Shotton (Microsoft Research Cambridge). In addition, we bring to you a suite of industrial and academic demonstrations of cutting edge research and products.

We would like to thank all members of the program committee consisting of experts in computer vision, computer graphics and photogrammetry, for their efforts to make 3DV 2013 a success. We would also like to acknowledge the support of our gold sponsor Intel, our silver sponsors Adobe, Autodesk, Google, Microsoft Research, 3DSystems, as well as our bronze sponsors 4D View Solutions, Matterport, Qualcomm and URC Ventures, along with the institutional support we received from IEEE, Eurographics, the University of Washington, and the Graphics and Imaging Laboratory (GRAIL) in the Computer Science & Engineering.

We would also like to thank our local organizing committee and the chairs who helped us throughout the conference and publication process. Last but not least, we like to thank all authors for contributing to the high quality program of this year's 3DV.

We look forward to a great conference!

Yasutaka Furukawa, Ioannis Stamos, Camillo J. Taylor, *Program Chairs*
Brian Curless, *General Chair*
Bryan Russell, *Local Chair*
Sudipta Sinha, *Demos Chair*
Austin Reiter, *Publication Chair*
Ankit Gupta, *Conference Webmaster*

NOTES

Logistical support and registration services by:
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NOTES

June 29 (Saturday)

8:45 am - 9:00 am: Welcome

9:00 am - 10:00 am: Keynote 1

Scene Reconstruction with Commodity Range Cameras
Vladlen Koltun (Stanford University)

10:00 am - 11:00 am: Oral session 1

- ***Real-time 3D Reconstruction in Dynamic Scenes using Point-based Fusion*** - Maik Keller (Pmd technologies), Damien Lefloch, Martin Lambers (University of Siegen), Shahram Izadi (Microsoft Research Cambridge), Tim Weyrich (University College London), Andreas Kolb (University of Siegen).
- ***Stereo+Kinect for High Resolution Stereo Correspondences*** - Gowri Somanath (University of Delaware), Scott Cohen, Brian Price (Adobe), Chandra Kambhamettu.
- ***A Learned Joint Depth and Intensity Prior using Markov Random Fields*** - Daniel Herrera C., Juho Kannala (University of Oulu), Peter Sturm (INRIA Grenoble), Janne Heikkila (University of Oulu).

11:00 am - 11:15 am: Coffee break

11:15 pm - 12:15 pm: Oral session 2

- ***The Visual Turing Test for Scene Reconstruction*** - Qi Shan, Riley Adams, Brian Curless (University of Washington), Yasutaka Furukawa (Google Inc.), Steve Seitz (University of Washington).
- ***Creating Georegistered Point Clouds using Geographic Data*** - Chun-Po Wang, Noah Snavely (Cornell University).
- ***Watertight Planar Surface Meshing of Indoor Point-Clouds with Voxel Carving*** - Eric Turner, Avideh Zakhor (UC Berkeley).

12:15 pm - 1:15 pm: Keynote 2

Depth, You, and the World
Jamie Shotton (Microsoft Research Cambridge)

1:15 pm - 2:30 pm: Lunch break

2:30 pm - 4:30 pm: Posters and Demos 1

1. ***Real-time 3D Reconstruction in Dynamic Scenes using Point-based Fusion*** - Maik Keller (Pmd technologies), Damien Lefloch, Martin Lambers (University of Siegen), Shahram Izadi (Microsoft Research Cambridge), Tim Weyrich (University College London), Andreas Kolb (University of Siegen).

2. ***The Visual Turing Test for Scene Reconstruction*** - Qi Shan, Riley Adams, Brian Curless (University of Washington), Yasutaka Furukawa (Google Inc.), Steve Seitz (University of Washington).

3. ***Online Building Segmentation from Ground-based LiDAR Data in Urban Scenes*** - Jizhou Gao, Ruigang Yang (University of Kentucky).

4. ***SIFT-Realistic Rendering*** - Dominik Sibbing, Torsten Sattler, Bastian Leibe, Leif Kobbelt (RWTH Aachen University).

5. ***Omnistereo video textures without ghosting*** - Vincent Couture (Université de Montréal), Michael Langer (McGill University), Sebastien Roy (Université de Montréal).

6. ***High-Quality Stereo Video Matching via User Interaction and Space-Time Propagation*** - Chenxi Zhang (University of Kentucky), Brian Price, Scott Cohen (Adobe), Ruigang Yang (University of Kentucky).

7. ***Automatic Registration of Smooth Object Image to 3D CAD Model for Industrial Inspection Applications*** - Ser Nam Lim, Li Guan, Shubao Liu, XIngwei Yang (GE Global Research).

8. ***Training-based Object Recognition in Cluttered 3D Point Clouds*** - Guan Pang, Ulrich Neumann (Univ of Southern California).

9. ***Deriving Motion Constraints in Finger Joints of Individualized Hand Model for Manipulating by Data Glove*** - Takuya Funatomi, Takuya Yamane, Hirotane Ouchida, Masaaki Iiyama, Micihiko Minoh (Kyoto University).

10. ***Statistical Analysis of 3D Faces in Motion*** - Timo Bolkart, Stefanie Wuhrer (Saarland University).

11. ***Depth and Intensity based Edge Detection in Time-of-Flight Images*** - Henrik Schäfer (HCI, Heidelberg University), Frank Lenzen, Christoph Garbe.

12. ***Evaluation of 3D Feature Descriptors for Multi-modal Data Registration*** - Hansung Kim, Adrian Hilton (University of Surrey).

13. ***Towards Linear-time Incremental Structure from Motion*** - Changchang Wu (Google).

ON-CAMPUS WIRELESS ACCESS

USER NAME: summer13
PASSWORD: uwvisit13

14. ***Optimized Aperture for Estimating Depth from Projector's Defocus*** - Hiroshi Kawasaki (Saitama University), Yuki Horita, Hitoshi Masuyama, Satoshi Ono (Kagoshima University), Makoto Kimura, Yasuo Takane.

15. ***Minimal solution for uncalibrated absolute pose problem with a known vanishing point*** - Branislav Micusik (AIT Austrian Institute of Technology), Horst Wildenauer.

16. ***On-line Reconstruction of CAD Geometry*** - Klaus Denker, Daniel Hagel, Jakob Raible, Georg Umlauf (HTWG Konstanz) Bernd Hamann, (University of California, Davis).

17. ***Learning part-based models for animation from surface motion capture*** - Margara Tejera, Adrian Hilton (University of Surrey).

18. ***Synchronized submanifold embedding for robust and real-time capable head pose detection based on range images*** - Matthias Höffken (University of Ulm), Tianyi Wang (Daimler AG), Jürgen Wiest (Ulm University), Ulrich Kreßel (Daimler AG), Klaus Dietmayer (Ulm University).

19. ***Detecting Objects in Scene Point Cloud: A Combinational Approach*** - Jing Huang, Suya You (University of Southern California).

20. ***Shape and Reflectance from Scattering in Participating Media*** - Deniz Evrenci, Masaaki Iiyama, Takuya Funatomi, Micihiko Minoh (Kyoto University).

21. ***Non-rigid registration of depth images using Similarity-invariant differential coordinates*** - Shuntaro Yamazaki, Satoshi Kagami, Masaaki Mochimaru (AIST).

22. ***3D Object Recognition By Surface Registration of Interest Segments*** - Joseph Lam, Michael Greenspan (Queen's University).

23. ***A Study of Point Cloud Registration with Probability Product Kernel Functions*** - Hanchen Xiong, Sandor Szedmark, Justus Piater (University of Innsbruck).

24. ***Automatic Procedural Modeling of Tree Structures in Point Clouds Using Wavelets*** - Sam Friedman, Ioannis Stamos (City University of New York).

4:40 pm - 5:40 pm: Oral session 3

- ***Balloon shapes: reconstructing and deforming objects with volume from images*** - Sara Vicente, (Queen Mary, University London), Lourdes Agapito.
- ***X-ray and 3D Data Fusion for 3D Reconstruction of Closed Receptacle Contents*** - Pierluigi Taddei, Vitor Sequeira (Joint Research Centre).
- ***Single View Reconstruction of Peicewise Swept Surfaces*** - Avanish Kushal, Steve Seitz (University of Washington).

June 30 (Sunday)

9:00 am - 10:00 am: Keynote 3

Depth Cameras and Robotics

Dieter Fox (University of Washington)

10:00 am - 11:00 am: Oral session 4

- ***Robust and Accurate One-shot 3D Reconstruction by 2C1P System with Wave Grid Pattern*** - Nozomu Kasuya, Ryusuke Sagawa (AIST), Ryo Furukawa, Hiroshi Kawasaki (Saitama University).
- ***3D Semantic Parameterization for Human Shape Modeling: Application to 3D Animation*** - Christian Rupprecht, Olivier Pauly (Technische universität München), Christian Theobalt (Max Planck Institute), Slobodan Ilic (Technische Universität München).
- ***Interactive Depth-Aware Effects for Stereo Image Editing*** - Josh Abbott, Bryan Morse (Brigham Young University).

11:00 am - 11:15 am: Coffee Break

11:15 am - 12:15 pm: Keynote 4

The Limits of Human Stereopsis in Space and Time

Martin Banks (University of California, Berkeley)

12:15 pm - 1:15 pm: Oral session 5

- ***Multi-task Forest for Human Pose Estimation in Depth Images*** - Joe Lallemand (BMW Group), Olivier Pauly (Technische universität München), Loren Schwarz (BMW Group), David Joseph Tan, Slobodan Ilic (Technische Universität München).
- ***Personalization and Evaluation of a Real-time Depth-based Full Body Tracker*** - Thomas Helten, Andreas Baak (MPI Informatik), Gaurav Bharaj (Harvard University), Meinard Müller (International Audiolabs Erlangen), Hans-Peter Seidel, Christian Theobalt (MPI Informatik).
- ***Robust Human Body Shape and Pose Tracking*** - Chun-Hao Huang (Technical University of Munich), Edmond Boyer, Slobodan Ilic (Technische Universität München).

1:15 pm - 2:30 pm: Lunch break

2:30 pm - 4:30 pm: Posters and Demos 2

1. ***Robust and Accurate One-shot 3D Reconstruction by 2C1P System with Wave Grid Pattern*** - Nozomu Kasuya, Ryusuke Sagawa (AIST), Ryo Furukawa, Hiroshi Kawasaki (Saitama University).

2. ***3D Semantic Parameterization for Human Shape Modeling: Application to 3D Animation*** - Christian Rupprecht, Olivier Pauly (Technische universität München), Christian Theobalt (Max Planck Institute), Slobodan Ilic (Technische Universität München).

3. ***Multi-task Forest for Human Pose Estimation in Depth Images*** - Joe Lallemand (BMW Group), Olivier Pauly (Technische universität München), Loren Schwarz (BMW Group), David Joseph Tan (Technische Universität München), Slobodan Ilic (Technische Universität München).

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5. *R**obust Human Body Shape and Pose Tracking*** - Chun-Hao Huang (Technical University of Munich), Edmond Boyer, Slobodan Ilic (Technische Universität München).

6. ***3D Face Template Registration Using Normal Maps*** - Zhongjie Wang (MPII), Martin Grochulla (Thorsten Thormählen).

7. ***Automatic Rail Extraction in Terrestrial and Airborn Lidar Data*** - Mustafa Mohamad (Queen's University), Kresimir Kusevic, Paul Mrstick (GeoDigital International Inc.), Michael Greenspan(Queen's University).

8. ***Measurement of Individual Changes in the Performance of Human Stereoscopic Vision for Disparities at the Limits of the Zone of Comfortable Viewing*** - Jan Paulus, Björn Eskofier, Joachim Hornegger, Michael Schmidt, Georg Michelson (University of Erlangen), Marcus Barkowsky (Institut de Recherche en Communications et Cybernétique de Nantes).

9. ***Assisted multi-view stereo reconstruction*** - Matteo Dellepiane, Emanuele Cavarretta, Paolo Cignoni, Roberto Scopigno (ISTI-CNR).

10. ***Fast and stable algebraic solution to L_2 thee-view triangulation*** - Zuzana Kukelova (CTU in Prague), Martin Bujnak, Tomas Pajdla (Prague Technical University).

11. ***Shape and Pose Space Deformation for Subject Specific Animation*** - Alexandros Neophytou, Adrian Hilton (University of Surrey).

12. ***Fast and Accurate Calibration of a Kinect Sensor -*** Carolina Raposo, Joao Barreto (University of Coimbra), Urbano Nunes.

13. ***Object Class Recognition in Mobile Urban Lidar Data Using Global Shape Descriptors*** - Salar Awan, Mustafa Mohamad (Queen's University), Kresimir Kusevic, Paul Mrstick (GeoDigital International Inc.), Michael Greenspan (Queen's University).

14. ***Space-time Parameterized Variety Manifolds: A Novel Approach for Arbitrary Multi-perspective 3D View Generation*** - Mansi Sharma, Santanu Chaudhury, Brejesh Lall (Indian Institute of Technology Delhi).

15. ***3D Implicit Shape Models using Ray based Hough Voting for Furniture Recognition*** - Jens Wittrowski, Agnes Swadzba (Bielefeld University).

16. ***Geometric and Color Calibration of Multiview Panoramic Cameras for Life-Size 3D Immersive Video*** - Gregorij Kurillo, Harlyn Baker, Zeyu Li, Ruzena Bajcsy (University of California, Berkeley).

17. ***Direct Shape Recovery from Photometric Stereo with Shadows*** - Roberto Mecca, Aaron Wetzler, Ron Kimmel, Alfred Bruckstein (Technion).

18. ***Evaluation of Methods for Optical 3-D Scanning of Human Pinnas*** - Andreas Reichinger (VRVis Forschungs-GmbH), Piotr Majdak, Robert Sablatnig (Vienna University of Technology), Stefan Maierhofer (VRVis Forschungs GmbH).

19. ***Patch Volumes: Segmentation-based Consistent Mapping with RGB-D Cameras*** - Peter Henry, Dieter Fox (University of Washington), Achintya Bhowmik, Rajiv Mongia (Intel).

20. ***An Iterative Method for Improving Feature Matches*** - Johannes Furch, Peter Eisert (Fraunhofer HHI).

21. ***Augmented Motion History Volume for Spatiotemporal Editing of 3D Video in Multi-party Interaction Scenes*** - Qun Shi, Shohei Nobuhara, Takashi Matsuyama (Kyoto University).

22. ***CrowdCam: Instantaneous Navigation of Crowd Images using Angled Graph*** - Aydin Arpa (MIT), Luca Ballan (ETH Zurich), Rahul Sukthankar (Google Research), Gabriel Taubin (Brown University), Marc Pollefeys (ETH Zurich), Ramesh Raskar.

23. ***Model-Based Vehicle Pose Estimation and Tracking in Videos Using Random Forests*** - Michael Hödlmoser (Vienna University of Tech.), Branislav Micusik (AIT Austrian Institute of Technology), Marc Pollefeys (ETH Zurich), Ming-Yu Liu (Mitsubishi Electric Research Labs), Martin Kampel (Vienna University of Technology).

24. ***Sparse Point Cloud Densification by Combining Multiple Segmentation Methods*** - Michael Hödlmoser (Vienna University of Tech.), Branislav Micusik (AIT Austrian Institute of Technology), Martin Kampel (Vienna University of Technology).

4:40 pm - 5:40 pm: Keynote 5

Ten Things You Should Know About Large Scale 3D Reconstruction
Martin Byröd (Apple Maps)

5:40 pm - 5:50 pm: Closing Remarks

7:00 pm: Banquet at the Space Needle

Demos, 2:30 pm - 4:30 pm *(June 29 and 30)*

Industry

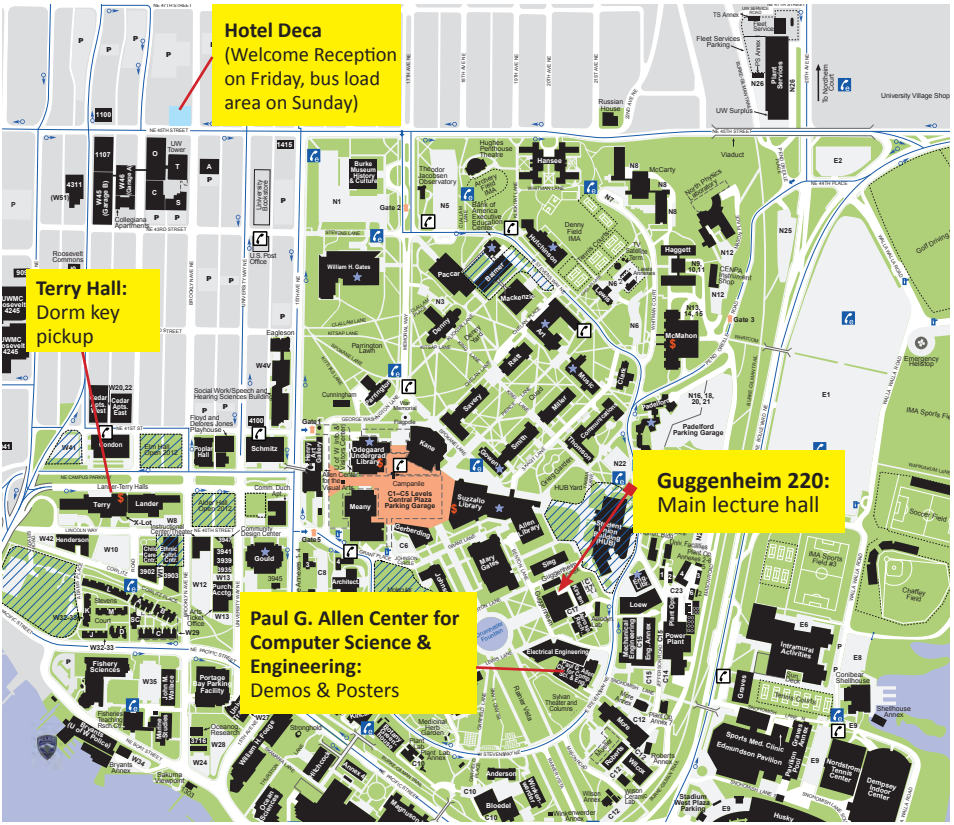
1. ***Multi-camera 4D capture,*** 4D View Solutions
2. ***DLP Lightcrafter based Structured Light Depth Imaging System,*** Texas Instruments Inc.
3. ***Stereo IP Network Camera Demo,*** Texas Instruments Inc.
4. *3D Skeletal Hand Tracking,* Intel
5. ***Matterport's system for easy and automatic 3D reconstruction of interior spaces,*** Matterport
6. ***Geomagic Fuse,*** 3D Systems Corp.
7. ***Modeling the Himalayas from massive image sets,*** URC Ventures
8. ***Autodesk ReCap: A family of software and services to create intelligent 3D data from photos and laser scans,*** Autodesk

Academia

9. ***PointCraft,*** Kathleen Tuite and Rahul Banerjee (University of Washington)
10. ***SLAM++: Simultaneous Localisation and Mapping at the Level of Objects,*** Renato F. Salas-Moreno (Imperial College London), Richard A. Newcombe (University of Washington), Hauke Strasdat (Imperial College London), Paul H. J. Kelly (Imperial College London) and Andrew J. Davison (Imperial College London)
11. ***Creating Georegistered Point Clouds using Geographic Data,***[#] Chun-Po Wang and Noah Snavely (Cornell University)
12. ***3D Semantic Parameterization for Human Shape Modeling: Application to 3D Animation,***[o] Christian Rupprecht (TU Munich), Olivier Pauly (TU Munich), Christian Theobalt (Max Planck Institute, Germany), Slobodan Ilic (TU Munich)
13. ***Augmented Motion History Volume for Spatiotemporal Editing of 3D Video in Multi-party Interaction Scenes***,[o] Qun Shi, Shohei Nobuhara and Takashi Matsuyama (Kyoto University)

[#] *shown during Poster/Demo Session 1 (June 29)*
[o] *shown during Poster/Demo Session 2 (June 30)*

CAMPUS AREA MAP

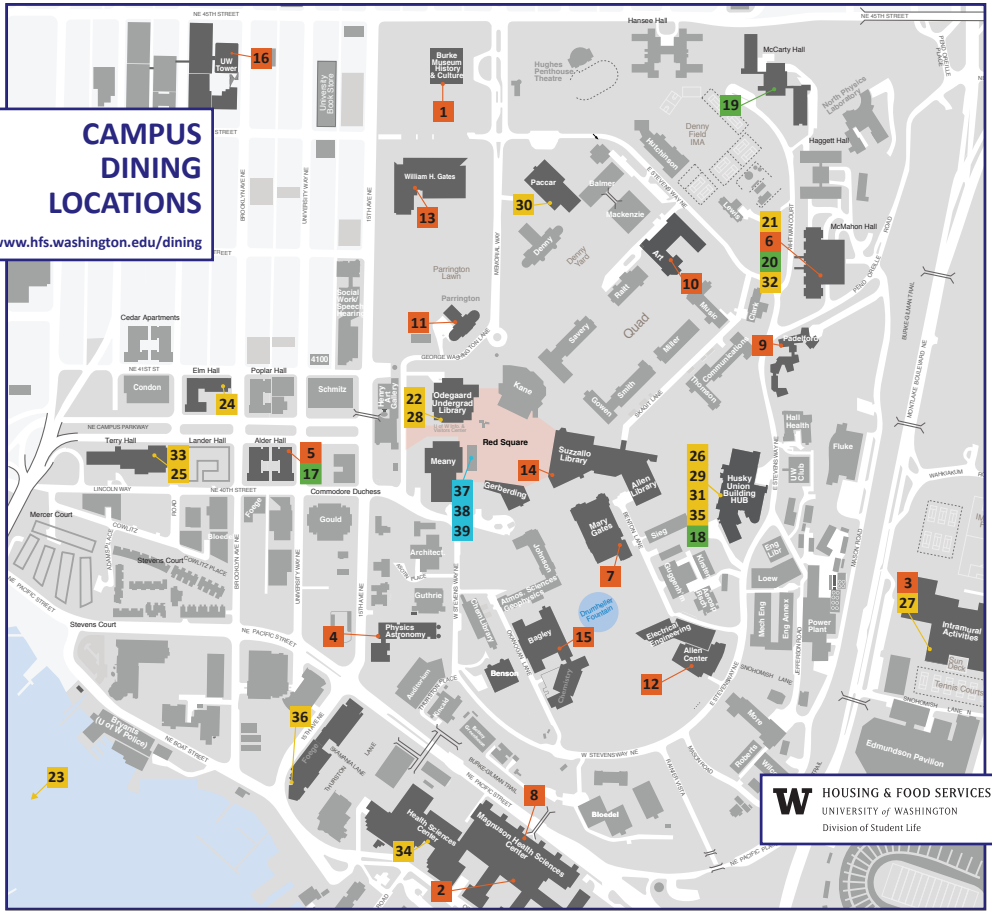


University Way (or "The Ave") eateries:
http://admit.washington.edu/Visit/Map/Lunch

University Way NE, better known as "The Ave" is the commercial heart of the University District and the off-campus extension of the University of Washington (UW) in Seattle. The Ave has gradually turned into what now resembles an eight-block-long global food court. It runs from just below NE Pacific Street in the south to 55th Street to the north. Cheap and delicious ethnic food and coffee shops are abundant. You can find coffee, sandwiches to go, sit down restaurants, used clothing shops, a U.S. post office, used bookstores, drug stores, banks and cash machines there.

CAMPUS DINING LOCATIONS

www.hfs.washington.edu/dining



ESPRESSO

1. Burke Museum Café, Burke Museum of Natural History and Culture
2. Court Café, Magnuson Health Sciences Center E-court
3. Dawg Bites, Intramural Activities Building (IMA)
4. H-bar, Physics-Astronomy Building
5. Husky Grind at District Market, Alder Hall
6. Joe Haus, McMahon Hall
7. Mary Gates Hall Espresso, Mary Gates Hall
8. Overpass Espresso, Magnuson Health Sciences Center T-wing
9. Padelford Espresso, Padelford Hall
10. Parnassus, Art Building
11. Public Grounds, Parrington Hall
12. Reboot, Paul G. Allen Center for Computer Science & Engineering
13. The Supreme Cup, William H. Gates Hall
14. Suzzallo Espresso, Suzzallo Library
15. Think Tank, Bagley Hall
16. Tower Café, UW Tower

MARKETS

17. District Market, Alder Hall
18. Etc., Husky Union Building (HUB)
19. Ian's Domain, McCarty Hall
20. The Nook, McMahon Hall

RESTAURANTS & CAFÉS

21. The 8, McMahon Hall (cashless)
22. By George, Odegaard Undergraduate Library
23. Café 815 Mercer, UW Medicine at South Lake Union
24. Cultivate, Elm Hall
25. Eleven 01 Café, Terry Hall
26. Freshēns Smoothies, Husky Union Building (HUB)
27. Freshēns Smoothies, Intramural Activities Building (IMA)
28. Freshēns Smoothies, Odegaard Undergraduate Library
29. Husky Den, Husky Union Building (HUB)
30. Orin's Place, Paccar Hall
31. Pagliacci Pizza, Husky Union Building (HUB)
32. Pagliacci Pizza, McMahon Hall
33. Pagliacci Pizza, Terry Hall
34. The Rotunda, Magnuson Health Sciences Center H-wing
35. SUBWAY, Husky Union Building (HUB)
36. Vista Café, William H. Foege Building

UW STREET FOOD (CASHLESS)

37. Hot Dawgs, Red Square
38. Motosurf, Red Square
39. Red Square BBQ, Red Square

WE ACCEPT

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9/25/12

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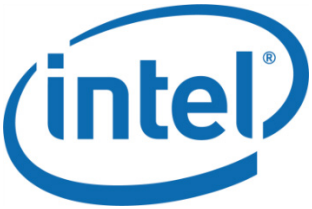

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