Xue Bin (Jason) Peng

Assistant Professor

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EDUCATION

- **Assistant Professor,** *Simon Fraser University* 2022–Present
- **Research Scientist,** *NVIDIA* 2022–Present
- **PhD in Computer Science**, *University of California, Berkeley* 2017–2021
- **MSc in Computer Science**, *University of British Columbia* 2015 –2017
  - Governor-General's Gold Medal
    - top of master's class across all faculties (~2000 students)
- **Computer Science Honours**, *University of British Columbia* 2010 – 2015
  - Governor-General's Silver Medal in Science
    - top of undergrad class in faculty of science (~2000 students)
- **School of Interactive Arts and Technology**, *Simon Fraser University* 2009 – 2010

PUBLICATIONS

Refereed Journals/Conferences

- Haotian Zhang, Ye Yuan, Viktor Makoviychuk, Yunrong Guo, Sanja Fidler, **Xue Bin Peng**, and Kayvon Fatahalian. Learning Physically Simulated Tennis Skills from Broadcast Videos. *ACM Transactions on Graphics (Proc. SIGGRAPH 2023)* (2023).

- Mohamed Hassan, Yunrong Guo, Tingwu Wang, Michael Black, Sanja Fidler, and **Xue Bin Peng**. Synthesizing Physical Character-Scene Interactions. *In ACM SIGGRAPH 2023 Conference Proceedings* (2023).

- Chen Tessler, Yoni Kasten, Yunrong Guo, Shie Mannor, Gal Chechik, and **Xue Bin Peng**. CALM: Conditional Adversarial Latent Models for Directable Virtual Characters. *In ACM SIGGRAPH 2023 Conference Proceedings (SIGGRAPH '23)* (2023).

- Laura M. Smith, J. Chase Kew, Tianyu Li, Linda Luu, **Xue Bin Peng**, Sehoon Ha, Jie Tan, and Sergey Levine. Learning and Adapting Agile Locomotion Skills by Transferring Experience. *In Robotics: Science and Systems XIX* (2023).

- Davis Rempe, Zhengyi Luo, **Xue Bin Peng**, Ye Yuan, Kris Kitani, Karsten Kreis, Sanja Fidler, and Or Litany. Trace and Pace: Controllable Pedestrian Animation via Guided Trajectory Diffusion. *In Conference on Computer Vision and Pattern Recognition (CVPR)* (2023).

- Zhongyu Li, **Xue Bin Peng**, Pieter Abbeel, Sergey Levine, Glen Berseth, and Koushil Sreenath. Robust and Versatile Bipedal Jumping Control through Reinforcement Learning. *In Robotics: Science and Systems XIX* (2023).

- Gilbert Feng, Hongbo Zhang, Zhongyu Li, **Xue Bin Peng**, Bhuvan Basireddy, Linzhu Yue, Zhitao Song, Lizhi Yang, Yunhui Liu, Koushil Sreenath, and Sergey Levine. GenLoco:

Generalized Locomotion Controllers for Quadrupedal Robots. *In Proceedings of The 6th Conference on Robot Learning (Proceedings of Machine Learning Research)* (2023)

- Michael Laskin, Hao Liu, **Xue Bin Peng**, Denis Yarats, Aravind Rajeswaran, and Pieter Abbeel. Unsupervised Reinforcement Learning with Contrastive Intrinsic Control. *In Advances in Neural Information Processing Systems* (2022).

- Jordan Juravsky, Yunrong Guo, Sanja Fidler, and **Xue Bin Peng**. PADL: Language-Directed Physics-Based Character Control. *In SIGGRAPH Asia 2022 Conference Papers* (2022).

- Alejandro Escontrela, **Xue Bin Peng**, Wenhao Yu, Tingnan Zhang, Atil Iscen, Ken Goldberg, and Pieter Abbeel. Adversarial Motion Priors Make Good Substitutes for Complex Reward Functions. *International Conference on Intelligent Robots and Systems* (2022).

- Yandong Ji, Zhongyu Li, Yinan Sun, **Xue Bin Peng**, Sergey Levine, Glen Berseth, and Koushil Sreenath. Hierarchical Reinforcement Learning for Precise Soccer Shooting Skills using a Quadrupedal Robot. *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (2022).

- **Xue Bin Peng**, Yunrong Guo, Lina Halper, Sergey Levine, Sanja Fidler. ASE: Large-Scale Reusable Adversarial Skill Embeddings for Physically Simulated Characters. *ACM Transactions on Graphics (Proc. SIGGRAPH 2022)* 41, 4 (2022).

- Laura Smith, J. Chase Kew, **Xue Bin Peng**, Sehoon Ha, Jie Tan, Sergey Levine. Legged Robots that Keep on Learning: Fine-Tuning Locomotion Policies in the Real World. *IEEE International Conference on Robotics and Automation (ICRA),* (2022).

- Seungmoon Song, Łukasz Kidziński, **Xue Bin Peng**, Carmichael Ong, Jennifer Hicks, Sergey Levine, Christopher G. Atkeson, Scott L. Delp. Deep Reinforcement Learning for Modeling Human Locomotion Control in Neuromechanical Simulation. *Journal of NeuroEngineering and Rehabilitation,* (2021).

- Eric Mitchell, Rafael Rafailov, **Xue Bin Peng**, Sergey Levine, Chelsea Finn. Offline Meta-Reinforcement Learning with Advantage Weighting. *International Conference on Machine Learning (ICML),* (2021).

- **Xue Bin Peng,** Ze Ma, Pieter Abbeel, Sergey Levine, and Angjoo Kanazawa. AMP: Adversarial Motion Priors for Stylized Physics-Based Character Control. *ACM Transactions on Graphics (Proc. SIGGRAPH 2021)* 40, 4 (2021).

- Zhongyu Li, Xuxin Cheng, **Xue Bin Peng**, Pieter Abbeel, Sergey Levine, Glen Berseth, and Koushil Sreenath. Reinforcement Learning for Robust Parameterized Locomotion Control of Bipedal Robots. *IEEE International Conference on Robotics and Automation (ICRA),* (2021).

- **Xue Bin Peng**, Erwin Coumans, Tingnan Zhang, Tsang-Wei Lee, Jie Tan, Sergey Levine. Learning Agile Robotic Locomotion Skills by Imitating Animals. *Robotics: Science and Systems (RSS),* (2020). **Best paper**.

- Anirudh Goyal, Shagun Sodhani, Jonathan Binas, **Xue Bin Peng**, Sergey Levine, and Yoshua Benjio. Reinforcement Learning with Competitive Ensembles of Information-Constrained Primitives. *International Conference on Learning Representations (ICLR),* (2020).

- Farzad Abdolhosseini, Hung Yu Ling, Zhaoming Xie, **Xue Bin Peng**, and Michiel van de Panne. On Learning Symmetric Locomotion. *Motion, Interaction and Games (MIG),* (2019).

- **Xue Bin Peng,** Michael Chang, Grace Zhang, Pieter Abbeel, Sergey Levine. MCP: Learning Composable Hierarchical Control with Multiplicative Compositional Policies. *Neural Information Processing Systems (NeurIPS),* (2019).
- **Xue Bin Peng,** Angjoo Kanazawa, Sam Toyer, Pieter Abbeel, and Sergey Levine. Variational Discriminator Bottleneck: Improving Imitation Learning, Inverse RL, and GANs by Constraining Information Flow. *International Conference on Learning Representations (ICLR),* (2019).
- **Xue Bin Peng,** Angjoo Kanazawa, Jitendra Malik, Pieter Abbeel, and Sergey Levine. SFV: Reinforcement Learning of Physical Skills from Videos. *ACM Transactions on Graphics (Proc. SIGGRAPH Asia 2018)* 37, 6 (2018).
- **Xue Bin Peng,** Pieter Abbeel, Sergey Levine, and Michiel van de Panne. DeepMimic: Example-Guided Deep Reinforcement Learning of Physics-Based Character Skills. *ACM Transactions on Graphics (Proc. SIGGRAPH 2018)* 37, 4 (2018).
- **Xue Bin Peng,** Marcin Andrychowicz, Wojciech Zaremba, and Pieter Abbeel. Sim-to-Real Transfer of Robotic Control with Dynamics Randomization. *IEEE International Conference on Robotics and Automation (ICRA),* (2018).
- **Xue Bin Peng,** Glen Berseth, KangKang Yin, and Michiel van de Panne. DeepLoco: Dynamic Locomotion Skills Using Hierarchical Deep Reinforcement Learning. *ACM Transactions on Graphics (Proc. SIGGRAPH 2017)* 36, 4 (2017).
- **Xue Bin Peng,** and Michiel van de Panne. Learning Locomotion Skills Using DeepRL: Does the Choice of Action Space Matter? *Proc. ACM SIGGRAPH / Eurographics Symposium on Computer Animation* (2017). **Best student paper**.
- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Terrain-adaptive locomotion skills using deep reinforcement learning. *ACM Transactions on Graphics (Proc. SIGGRAPH 2016)* 35, 4 (2016).
- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Dynamic Terrain Traversal Skills Using Reinforcement Learning. *ACM Transactions on Graphics (Proc. SIGGRAPH 2015)* 34, 4 (2015).

Non-Refereed

- Xiaoyu Huang, Zhongyu Li, Yanzhen Xiang, Yiming Ni, Yufeng Chi, Yunhao Li, Lizhi Yang, **Xue Bin Peng**, and Koushil Sreenath. Creating a Dynamic Quadrupedal Robotic Goalkeeper with Reinforcement Learning. *arXiv preprint arXiv: 2210.04435* (2022).
- Aviral Kumar, **Xue Bin Peng,** and Sergey Levine. Reward-Conditioned Policies. *arXiv preprint arXiv: 1912.13465* (2019).
- **Xue Bin Peng,** Aviral Kumar, Grace Zhang, and Sergey Levine. Advantage-Weighted Regression: Simple and Scalable Off-Policy Reinforcement Learning. *arXiv preprint arXiv: 1910.00177* (2019).

Posters and Abstracts

- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Learning Locomotion Skills Using DeepRL: Does the Choice of Action Space Matter? *NIPS Deep Reinforcement Learning Workshop,* (2016).

- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Terrain-adaptive locomotion skills using deep reinforcement learning. *NIPS Deep Learning Symposium*, (2016).
- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Dynamic Locomotion Across Variable Terrains Using Deep Reinforcement Learning. *Dynamic Walking*, (2016).
- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Dynamic Locomotion Skills for Obstacle Sequences Using Reinforcement Learning. *Dynamic Walking*, (2015).
- **Xue Bin Peng,** Glen Berseth, and Michiel van de Panne. Learning Dynamic Locomotion Skills for Terrains with Obstacles. *Reinforcement Learning and Decision Making*, (2015).

AWARDS

- **Outstanding Doctoral Dissertation Award**, *ACM SIGGRAPH* 2022
- **Sevin Rosen Funds Award for Innovation**, *University of California, Berkeley* 2021
- **Berkeley Fellowship For Graduate Study**, *University of California, Berkeley* 2017-2020
- **NSERC Postgraduate Scholarship**, *University of California, Berkeley* 2017-2020

- **Governor-General's Gold Medal in Science**, *University of British Columbia* 2017
  - top of master's class across all faculties (~2000 students)
- **NSERC Canada Graduate Scholarship Master's Award**, *University of British Columbia* 2017
- **Theodore E Arnold Fellowship**, *University of British Columbia* 2015-2016
- **CS Merit Award**, *University of British Columbia* 2015-2017

- **Governor-General's Silver Medal in Science**, *University of British Columbia* 2015
  - top of undergraduate class in faculty of science (~2000 students)
- **Greer Family Scholarship**, *University of British Columbia* 2013
- **Marie Kendall Memorial Scholarship in Science**, *University of British Columbia* 2013
- **Charles and Jane Banks Scholarship**, *University of British Columbia* 2011
- **Computer Science Scholarship**, *University of British Columbia* 2011
- **Trek Excellence Scholarship**, *University of British Columbia* 2011-2015
- **Norman A M MacKenzie Scholarship**, *University of British Columbia* 2010
- **President's Entrance Scholarship**, *University of British Columbia* 2010

- **Gordon M. Shrum Scholarship**, *Simon Fraser University* 2009 – 2010

WORK EXPERIENCE

Research Scientist Intern, *NVIDIA* May, 2021 – June, 2022
- Developed imitation learning framework for physics-based character animation.

Research Intern, *Google Brain* June, 2019 – May, 2020
- Developed framework for learning locomotion skills from demonstrations for quadruped robots.

Member of Technical Staff (Intern), *OpenAI* May – Aug., 2017
- Explored methods for transferring control policies from simulation to a physical robot

Research Intern, *Adobe Research* May – Aug., 2015
- Explored methods for physically-plausible motion control of simulated characters

Lab Associate (Intern), *Disney Research Pittsburgh* Jan. – May, 2015
- Developed models of human gameplay strategies through imitation learning
- Instrumented game to collect player data

Intern Software Developer, *Microsoft Studios* May – Nov., 2013
- Developed real-time analytic approximation of area lights with different BRDFs
- Implemented clustered forward lighting
- Implemented environment map volumes and parallax correction

Co-op Rendering Engineer, *Capcom Vancouver* Jan. – Aug., 2012
- Designed and created various rendering features through HLSL and C++
- Designed a system for physically inspired image based lighting, utilizing real-time generation of dynamic environment maps
- Implemented subsurface scattering for skin, distance field text and decal rendering, vertex animation, deferred lights, HDR cubemap support for Maya, and a variety of post-effects

TEACHING EXPERIENCE

Graduate Student Instructor, *University of California, Berkeley*
- CS 188: Introduction to Artificial Intelligence Jan. – May, 2019

Graduate Teaching Assistant, *University of British Columbia*
- CPSC 426: Computer Animation Jan. – May, 2017

Undergraduate Teaching Assistant, *University of British Columbia*
- CPSC 314: Computer Graphics Sep. – Dec., 2014
- CPSC 110: Computation, Programs, and Programming Sep. – Dec. 2011

Service

Paper Committee
- SIGGRAPH Asia 2022

Reviewer 2016 - Present
- Reviewer for paper submissions to SIGGRAPH, SIGGRAPH ASIA, TOG, Eurographics, SCA, NeurIPS, ICML, ICLR, RSS, ICRA, IROS, CoRL, RA-L

Competition Organizer
- Organizer for NeurIPS 2019: Learn to Move – Walk Around competition