Xue Bin (Jason) Peng

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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
  - Advisor: Sergey Levine and Pieter Abbeel

- **MSc in Computer Science**, *University of British Columbia*   2015 –2017
  - Advisor: Michiel van de Panne
  - 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

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

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). **Best Paper Honourable Mention**.

- 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).

- Alejandro Escontrela, Ademi Adeniji, Wilson Yan, Ajay Jain, **Xue Bin Peng**, Ken Goldberg, Youngwoon Lee, Danijar Hafner, Pieter Abbeel. Video Prediction Models as Rewards for Reinforcement Learning. *Neural Information Processing Systems (NeurIPS),* (2023).

- 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. *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (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).

- Kevin Zakka, Philipp Wu, Laura Smith, Nimrod Gileadi, Taylor Howell, **Xue Bin Peng**, Sumeet Singh, Yuval Tassa, Pete Florence, Andy Zeng, Pieter Abbeel. RoboPianist: Dexterous Piano Playing with Deep Reinforcement Learning. *Conference on Robot Learning (CoRL)* (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

- 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).

INDUSTRY 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

Invited Talks

Acquiring Motor Skills Through Motion Imitation and Reinforcement Learning
Fourier Intelligence Co., Ltd
Shanghai, China, October 19, 2023

Learning to Move from Videos
Electronic Arts Inc.
Burnaby, British Columbia, Canada, August 23, 2023

Adversarial Imitation Learning for Motor Control
SFU Visual Computing Workshop
Vancouver, British Columbia, Canada, August 7, 2022

Imitation Learning for Data-Driven Physics-Based Character Control
Adobe Inc.
San Jose, California, USA, April 22, 2021

Data-Driven Physics-Based Character Animation with Imitation Learning
Peking University
Beijing, China, March 24, 2021

Learning Agile Robotic Locomotion Skills by Imitating Animals
New York University
New York, New York, USA, November 2, 2020

Data-Driven Physics-Based Character Animation with Imitation Learning
Electronic Arts Inc.
Redwood City, California, USA, February 21, 2020

Data-Driven Physics-Based Character Animation with Imitation Learning
Bellairs Workshop
Folkestone, St. James, Barbados, July 23, 2019

Towards a Virtual Stuntman
Boston Dynamics
Waltham, Massachusetts, USA, July 23, 2018

Developing Locomotion Skills with Reinforcement Learning
Google LLC
Mountain View, California, USA, March 14, 2017

TEACHING

Instructor*, Simon Fraser University*   2022 – Present
- CMPT 361: Intro to Visual Computing
- CMPT 729: Reinforcement Learning

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