

# Siyuan (Simon) Xing

## Curriculum Vitae

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### Education

- 2016-2019 *Southern Illinois University Carbondale*, Illinois, USA
- Ph.D. in Engineering Science.
  - Thesis: Nonlinear modeling for regenerative cutting with forced vibration.
- 2013-2016 *Southern Illinois University Edwardsville*, Illinois, USA
- M.S. in Mechanical Engineering.
- 2009-2013 *Sichuan University*, Sichuan, China
- B.S. in Electrical Engineering.

### Professional Appointments

2019-present Assistant Professor, *California Polytechnic State University*, California, USA

### Research Interests

Nonlinear dynamics and control, bifurcation theory, continuous dynamical systems, discontinuous dynamical systems, nonlinear vibration, experimental vibration analysis, controller design, robotics, Mechatronics, high performance computing.

### Book Chapters

1. **Siyuan Xing**, Albert C.J. Luo (2019). “Sequential orders of periodic motions in a 1-D, delayed, nonlinear dynamical system”. In: *Nonlinear Dynamics, Chaos, and Complexity: In Memory of Valentin Afraimovich (1945–2018)*. Ed. by D Volchenkov, to appear.
2. Albert C.J. Luo, **Siyuan Xing** (2018). “Bifurcation trees of period-3 motions to chaos in a time-delayed Duffing oscillator”. In: *Regularity and Stochasticity of Nonlinear Dynamical Systems*. Ed. by D Volchenkov and X Leoncini. Vol. 21. Springer, Cham, pp. 247–262.
3. Albert C.J. Luo, **Siyuan Xing** (2018). “Time-delay effects on periodic motions in a duffing oscillator”. In: *Chaotic, Fractional, and Complex Dynamics: New Insights and Perspectives*. Ed. by M Edelman, EEN Macau, and MAF Sanjuan. Understanding Complex Systems. Springer, Cham, pp. 77–100.

### Refereed Journal Papers

1. **Siyuan Xing**, Albert C.J. Luo (2019). “Bifurcation trees of period-1 motions in a periodically excited, softening Duffing oscillator with time-delay”. *International Journal of Dynamics and Control* 7 (3), 842–855.
2. **Siyuan Xing**, Albert C.J. Luo (2019). “On a global sequential scenario of bifurcation trees to chaos in a first-order, time-delayed system”. *International Journal of Bifurcation and Chaos* 29 (10), 842–855.

3. **Siyuan Xing**, Albert C.J. Luo (2019). “On period-1 motions to chaos in a 1-dimensional, time-delay, nonlinear system”. *International Journal of Dynamics and Control (In print)*.
4. **Siyuan Xing**, Albert C.J. Luo (2019). “Periodic motions to chaos in a 1-dimensional, time-delay, nonlinear system”. *The European Physical Journal Special Topics* 228 (9), 1747–1765.
5. **Siyuan Xing**, Albert C.J. Luo (2018). “On possible infinite bifurcation trees of period-3 motions to chaos in a time-delayed, twin-well Duffing oscillator”. *International Journal of Dynamics and Control* 6 (4), 1429–1464.
6. Albert C.J. Luo, **Siyuan Xing** (2017). “Bifurcation trees of period-3 motions to chaos in a time-delayed duffing oscillator”. *Nonlinear Dynamics* 88 (4), 2831–2862.
7. Albert C.J. Luo, **Siyuan Xing** (2017). “Time-delay effects on periodic motions in a periodically forced, time-delayed, hardening Duffing oscillator”. *Journal of Vibration Testing and System Dynamics* 1 (1), 73–91.
8. **Siyuan Xing**, Albert C.J. Luo (2017). “Towards infinite bifurcation trees of period-1 motions to chaos in a time-delayed, twin-well Duffing oscillator”. *Journal of Vibration Testing and System Dynamics* 1 (4), 353–392.
9. Albert C.J. Luo, **Siyuan Xing** (2016). “Analytical predictions of period-1 motions to chaos in a periodically driven quadratic nonlinear oscillator with a time-delay”. *Mathematical Modeling of Natural Phenomena* 11, 75–88.
10. Albert C.J. Luo, **Siyuan Xing** (2016). “Multiple bifurcation trees of period-1 motions to chaos in a periodically forced, time-delayed, hardening Duffing oscillator”. *Chaos, Solitons & Fractals* 89, 405–434.
11. Albert C.J. Luo, **Siyuan Xing** (2016). “On frequency responses of period-1 motions to chaos in a periodically forced, time-delayed quadratic nonlinear system”. *International Journal of Dynamics and Control* 5 (3), 466–476.
12. Albert C.J. Luo, **Siyuan Xing** (2016). “Symmetric and asymmetric period-1 motions in a periodically forced, time-delayed, hardening Duffing oscillator”. *Nonlinear Dynamics* 85 (2), 1141–1166.

## Refereed Conference Papers

1. **Siyuan Xing**, Albert C.J. Luo (Nov. 2019). “Period-1 motions in a periodically forced, nonlinear, machine-tool system”. In: *International Mechanical Engineering Congress and Exposition*. Salt Lake City, Utah, USA.
2. **Siyuan Xing**, Albert C.J. Luo (Aug. 2019). “Regenerative cutting dynamics for a periodically forced machine-tool system”. In: *International Design Engineering Technical Conference & Computer & Information*. Anaheim, California, USA.
3. **Siyuan Xing**, Albert C.J. Luo (Nov. 2018). “Analytical prediction of periodic motion in a first order nonlinear delay differential equation by a semi-analytical method”. In: *International Mechanical Engineering Congress and Exposition*. Pittsburgh, Pennsylvania, USA.
4. Albert C.J. Luo, **Siyuan Xing** (Nov. 2017). “Analytical prediction of period-1 motions in a time-delayed, softening Duffing oscillator”. In: *International Mechanical Engineering Congress and Exposition*. Tampa, Florida, USA.

5. Albert C.J. Luo, **Siyuan Xing** (Aug. 2017). “Period-3 motions in a periodically forced, damped, double-well Duffing oscillator with time-delay”. In: *International Design Engineering Technical Conference & Computer & Information*. Cleveland, Ohio, USA.
6. Albert C.J. Luo, **Siyuan Xing** (Aug. 2016). “On complex periodic motions in a time-delayed, double-well Duffing oscillator with strong excitation”. In: *International Design Engineering Technical Conference & Computer & Information*. Charlotte, NC, USA.
7. Albert C.J. Luo, **Siyuan Xing** (Nov. 2016). “On the time-delayed effect of a periodic forced, damped, hardening Duffing oscillator”. In: *International Mechanical Engineering Congress and Exposition*. Phoenix, NC, USA.
8. Albert C.J. Luo, **Siyuan Xing** (Nov. 2015). “An analytical prediction of period-1 motions to chaos in a time-delayed, quadratic nonlinear oscillator through implicit mappings”. In: *International Mechanical Engineering Congress and Exposition*. Houston, TX, USA.

## Presentations and Posters

1. **Siyuan Xing**, Albert C.J. Luo (Oct. 2018). “On the quantitative analysis of periodic motions in a time-delayed, softening, Duffing oscillator”. In: *4st Annual Meeting of SIAM Central States Section*. Norman, OK, USA.
2. **Siyuan Xing**, Albert C.J. Luo (Aug. 2018). “Periodic motion to chaos in a first-order, time-delayed, nonlinear dynamical system”. Poster presented at *7th International Conference on Nonlinear Science and Complexity*, San Luis Potosí, México.
3. Albert C.J. Luo, **Siyuan Xing** (May 2016). “Complete routes of period-1 motions to chaos in a time-delayed Duffing oscillator”. In: *6th International Conference on Nonlinear Science and Complexity*. Sao Jose dos Campos, Brazil.
4. Albert C.J. Luo, **Siyuan Xing** (Apr. 2015). “From period-1 motions to chaos in a time-delayed, quadratic nonlinear oscillator”. In: *1st Annual Meeting of SIAM Central States Section*. Rolla, MO, USA.
5. Albert C.J. Luo, **Siyuan Xing** (May 2015). “On bifurcation trees for period-1 motion to chaos in a periodically forced quadratic nonlinear oscillator with time delay”. In: *6th International Conference on Nonlinear Science and Complexity*. La Manga, Spain.

## Invited Talks

1. **Siyuan Xing** (Oct. 2019). “Periodic motions to chaos in a time-delayed, double-well Duffing oscillator with strong excitation”. Invited talk at California Polytechnic State University, San Luis Obispo, CA, USA.
2. Albert C.J. Luo, **Siyuan Xing** (Dec. 2015). “An analytical prediction of period-1 motions to chaos in a time-delayed, Duffing nonlinear oscillator through implicit mappings”. Invited talk at Sichuan University of Science & Engineering, Zigong, Sichuan, China.
3. Albert C.J. Luo, **Siyuan Xing** (Dec. 2015). “Analytical predictions of Period-1 motions to chaos in a periodically driven Duffing nonlinear oscillator with a time-delay displacement”. Invited talk at Southwest Jiaotong University, Chengdu, Sichuan, China.

## Teaching Experience

**Assistant Professor** *California Polytechnic State University*  
Mechanical Control Systems

**Instructor** *Southern Illinois University Edwardsville*  
Numerical simulation (ME354)  
Stress laboratory (ME380L)  
Dynamics system modeling laboratory (ME356L)

## Grants and Awards

2018 Travel Grant for ASME IMECE, *Southern Illinois University Edwardsville.*

2017 Travel Grant for ASME IMECE, *Southern Illinois University Edwardsville.*

2016 Outstanding Teaching Assistant Award, *Southern Illinois University Edwardsville.*

2016 Travel Grant for ASME IDETC, *Southern Illinois University Edwardsville.*

2016 Outstanding Graduate Award, *Southern Illinois University Edwardsville.*

2015 Travel Grant for ASME IMECE, *Southern Illinois University Edwardsville.*

2013 Outstanding Undergraduate Cadres, *Sichuan University.*

2012 Honorable Mention, *Mathematical Contest In Modeling.*

2012 National Second Prize, *China Undergraduate Mathematical Contest In Modeling.*

## Professional Service

Reviewer *Journal of Applied Nonlinear Dynamics*

Reviewer *The European Physics Journal Special Topics*

Session Organizer *International Design Engineering Technical Conferences & Computers and  
& Reviewer Information in Engineering Conference, 2019*

Reviewer *International Mechanical Engineering Congress & Exposition, 2019*

## Professional Affiliations

Member American Society of Mechanical Engineers (since 2015)