

# Piyush Chaunsali

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<b>Research Area</b>	Sustainability and Durability of Infrastructure Materials	
<b>Education</b>	<b>University of Illinois at Urbana-Champaign, U.S.A.</b> Ph.D., Civil Engineering	<b>May 2015</b>
	<b>Clarkson University, U.S.A.</b> M.S., Civil Engineering	<b>July 2010</b>
	<b>National Institute of Technology, Warangal, India</b> B.Tech., Civil Engineering	<b>May 2007</b>
<b>Employment</b>	<b>Assistant Professor:</b> Civil Engineering, IIT Madras, May 2018– <b>Postdoctoral Associate:</b> Materials Science and Engg., MIT, July 2015–April 2018 <b>Graduate Engineer Trainee:</b> GMR Group, Dec 2007–Nov 2008 <b>Junior Engineer:</b> Gammon India Ltd., July–Nov 2007	
<b>Honors/Awards</b>	<ul style="list-style-type: none"><li>• Outstanding Reviewer, Journal of Materials in Civil Engineering(ASCE), 2020</li><li>• Kaufman Teaching Certificate Program (KTCP), MIT, 2016</li><li>• Listed among Teachers Ranked as Excellent by their Students, University of Illinois, Spring 2015</li><li>• Conference Travel Award, Graduate College, University of Illinois, 2014</li><li>• Chester P. Siess Award, Civil and Environmental Engineering, University of Illinois, 2013</li><li>• Ravindar K. and Kavita Kinra Fellowship, Civil and Environmental Engineering, University of Illinois, 2010–2012</li><li>• Merit Scholarship, NIT Warangal, 2004–2005</li><li>• Ranked 18<sup>th</sup> in the State (Uttarakhand) Merit List, Intermediate (12<sup>th</sup>) State Board Examination, 2001</li></ul>	
<b>Journal Publications</b>	<ol style="list-style-type: none"><li>[1] S. Vaishnav Kumar, R. Cepuritis and <b>P. Chaunsali</b>, “Influence of Exposure Conditions on Expansion Characteristics of Lime-Rich Calcium Sulfoaluminate-Belite Blended Cement,” <i>Cement and Concrete Composites</i>, Vol. 118, 103932, 2021.</li><li>[2] <b>P. Chaunsali</b> and S. Vaishnav Kumar, “Calcium Sulfoaluminate-Belite Cements: Opportunities and Challenges,” <i>Indian Concrete Journal</i>, Vol. 94, Issue 2, 2020, pp. 18–25.</li><li>[3] H. Uvegi, <b>P. Chaunsali</b>, B. Traynor and E. Olivetti, “Reactivity of industrial wastes as measured through ICP-OES: A case study on siliceous Indian biomass ash,” <i>Journal of American Ceramic Society</i>, Vol. 102, Issue 12, 2019, pp. 7678–7688.</li><li>[4] <b>P. Chaunsali</b>, H. Uvegi, B. Traynor and E. Olivetti, “Leaching Characteristics of Biomass Ash Binder in Neutral and Acidic Media,” <i>Cement and Concrete Composites</i>, Vol. 100, 2019, pp. 92–98.</li><li>[5] <b>P. Chaunsali</b>, A. Ardeshirilajimi and P. Mondal, “On the Interaction of Fly Ash with Portland Cement-Calcium Sulfoaluminate Cement Binder,” <i>Materials and Structures</i>, Vol. 51, Issue 131, 2018, pp. 1–9.</li></ol>	

- [6] **P. Chaunsali**, H. Uvegi, R. Osmundsen, M. Laracy, T. Poinot, J. Ochsendorf and E. Olivetti, “Mineralogical and Microstructural Characterization of Biomass Ash Binder,” *Cement and Concrete Composites*, Vol. 89, 2018, pp. 41–51.
- [7] A. Ardeshirilajimi, D. Wu, **P. Chaunsali** and P. Mondal, “Effects of Pre-Soaked Lightweight Aggregate on Deformation Properties of OPC-CSA Cement Blends,” *ACI Materials Journal*, Vol. 114, 2017, Issue 4, pp. 643–652.
- [8] **P. Chaunsali** and P. Mondal, “Physico-Chemical Interaction of Mineral Admixtures with an OPC-CSA cement System: Implication on Expansion,” *Cement and Concrete Research*, Vol 80, 2016, pp. 10–20.
- [9] **P. Chaunsali** and P. Mondal, “Hydration and Early-Age Expansion of Calcium Sulfoaluminate Cement-Based Binders: Experiments and Modeling,” *Journal of Sustainable Cement-Based Materials*, Vol. 5, Issue 4, 2016, pp. 259–267.
- [10] **P. Chaunsali** and P. Mondal, “Influence of Calcium Sulfoaluminate (CSA) Cement on Hydration and Expansion of an OPC-CSA Blend,” *Journal of the American Ceramic Society*, Vol. 98, Issue 8, 2015, pp. 2617–2624.
- [11] **P. Chaunsali** and P. Mondal, “Influence of Mineral Admixtures on Early-Age Behavior of Calcium Sulfoaluminate Cement,” *ACI Materials Journal*, Vol. 112, No. 1, 2015, pp. 59–68.
- [12] **P. Chaunsali** and S. Peethamparan, “Influence of Cement Kiln Dust Composition on its Interaction with Fly Ash and Slag,” *Cement and Concrete Research*, Vol. 54, 2013, pp. 106–113.
- [13] **P. Chaunsali** and S. Peethamparan, “A Novel Cementitious Binder Incorporating Cement Kiln Dust: Strength and Durability,” *ACI Materials Journal*, Vol. 110, Issue 3, 2013, pp. 297–304.
- [14] **P. Chaunsali** and S. Peethamparan, “Evolution of Strength, Microstructure and Mineralogical Composition of a CKD-GGBFS Binder,” *Cement and Concrete Research*, No. 41, 2011, pp. 197–208.
- [15] **P. Chaunsali** and S. Peethamparan, “Microstructural and Mineralogical Characterization of Cement Kiln Dust Activated Fly Ash Binder,” *Journal of the Transportation Research Board*, No. 2164, 2010, pp. 36–45.

**Peer-Reviewed  
Conference  
Publications**

- [1] T. Damion and **P. Chaunsali**, “Citric Acid Resistance of Calcium Sulfoaluminate-Based Binders,” *fib International Conference on Concrete Sustainability*, Prague, Czech Republic, Sept 2021.
- [2] S. Vaishnav Kumar, R. Cepuritis, and **P. Chaunsali**, “Influence of External Environment on Early-Age Expansion Characteristics of Calcium Sulfoaluminate Cement-Based Binders,” *Microdurability Conference*, The Hague, Netherlands, Oct 2020.
- [3] M. Suta, R. Cepuritis, S. Vaishnav Kumar, and **P. Chaunsali**, “On the application of steel fibre reinforced self-stressing concrete (SFRSSC) in watertight concrete structures,” *19<sup>th</sup> International Scientific Conference on Engineering for Rural Development*, Latvia, May 2020.
- [4] H. Uvegi, B. Traynor, **P. Chaunsali**, and E. Olivetti, “Determining viability of industrial byproducts in alkali activated systems,” *Proceedings of the International Congress on the Chemistry of Cement*, Prague, Sept 2019.
- [5] **P. Chaunsali**, H. Uvegi, B. Traynor, and E. Olivetti, “Durability of High Carbon Biomass Ash-Based Binder,” *Proceeding of the International Conference on Sustainable Materials, Systems and Structures Conference*, Rovinj, March 2019, pp. 172-179.
- [6] B. Traynor, H. Uvegi, **P. Chaunsali**, and E. Olivetti, “Reactivity of Crystalline Slags in Alkaline Solution,” *REWAS 2019*, pp. 177–187.
- [7] **P. Chaunsali** and P. Mondal, “Early-Age Volume Change and Hydration of Expansive Cements,” *10<sup>th</sup> fib International PhD Symposium*, Quebec City, July 2014.

- [8] P. Chaunsali, S. Lim, P. Mondal, and D. H. Tobias, "Factors Influencing the Early-Age Volume Change of Expansive Cements Relevant for Bridge Deck Concrete," *92<sup>nd</sup> Annual Meeting of Transportation Research Board*, Washington D.C., January 2013.

## Technical Reports

- [1] A. Ardeshirilajimi, D. Wu, P. Chaunsali, P. Mondal, Y. Chen, M. Rahman, A. Ibrahim, W. Lindquist, R. Hindi, "Bridge Decks: Mitigation of Cracking and Increased Durability (Phase 2)," *FHWA-ICT-16-016*, Illinois Center for Transportation, University of Illinois, Urbana, June 2016.
- [2] P. Chaunsali, S. Lim, P. Mondal, D. Foutch, D. Richardson, Y. Tung, and R. Hindi, "Bridge Decks: Mitigation of Cracking and Increased Durability (Phase 1)," *Report No. FHWA-ICT-13-023*, Illinois Center for Transportation, University of Illinois, Urbana, July 2013.

## Conference Presentations

(\* denotes speaker)

- [1] S. Vaishnav Kumar\* and P. Chaunsali, "Expansion Characteristics of Calcium Sulfoaluminate (CSA) Blended Cement: Influence of External Sulfates," *74<sup>th</sup> RILEM Annual Week and 40<sup>th</sup> Cement and Concrete Science Conference*, University of Sheffield, UK, Aug 31-Sept 4, 2020.
- [2] T. Damion\* and P. Chaunsali, "Acid Resistance of Calcium Sulfoaluminate-Based Binder," *74<sup>th</sup> RILEM Annual Week and 40<sup>th</sup> Cement and Concrete Science Conference*, University of Sheffield, UK, Aug 31-Sept 4, 2020.
- [3] H. Uvegi\*, B. Traynor, P. Chaunsali, and E. Olivetti, "Determining viability of industrial byproducts in alkali activated systems," *Proceedings of the International Congress on the Chemistry of Cement*, Prague, Sept 2019.
- [4] P. Chaunsali\*, H. Uvegi, B. Traynor, and E. Olivetti, "Durability of High Carbon Biomass Ash-Based Binder," *Sustainable Materials, Systems and Structures Conference*, Rovinj, Croatia, March 2019.
- [5] P. Chaunsali\*, "Early-Age Expansion of Ordinary Portland Cement-Calcium Sulfoaluminate Cement Blends," *Calcium Sulfoaluminate Cements Workshop*, Murten, Switzerland, June 2018.
- [6] H. Uvegi, P. Chaunsali\*, R. Osmundsen, J. Ochsendorf, and E. Olivetti, "Valorization of industrial biomass ash in structural materials," *253<sup>rd</sup> American Chemical Society National Meeting and Exposition*, San Francisco, USA, 2017.
- [7] H. Uvegi\*, P. Chaunsali, R. Osmundsen, J. Ochsendorf, and E. Olivetti, "Understanding Variability in Industrial Boiler Ash Waste for Use in Alkali Aluminosilicate Systems," *TMS Annual Meeting*, San Diego, USA, 2017.
- [8] P. Chaunsali\* and P. Mondal, "Early-Age Expansion of Calcium Sulfoaluminate Cement-Based Binders: Experiments and Modeling," *ACI Fall Convention*, Denver, USA, November 2015.
- [9] P. Chaunsali and P. Mondal\*, "Hydration and Early-Age Expansion of Calcium Sulfoaluminate-Based Cement: Experiments and Modeling," *14<sup>th</sup> International Congress on the Chemistry of Cement*, Beijing, China, October 2015.
- [10] P. Chaunsali\* and P. Mondal, "Physico-Chemical Interaction between Mineral Admixtures and an OPC-CSA Cement System: Implication on Expansion," *ACI Fall Convention*, Washington D.C., USA, October 2014.
- [11] P. Chaunsali\* and P. Mondal, "Influence of Mineral Admixtures on Early-Age Behavior of Calcium Sulfoaluminate Cement," *ACI Spring Convention*, Minneapolis, USA, April 2013.
- [12] S. Peethamparan\*, P. Chaunsali, and B. Clare, "Micro-Nano Structural Characteristics and Performance of CKD-Slag Blends," *ACI Fall Convention*, Pittsburgh, USA, October 2010.
- [13] S. Peethamparan\* and P. Chaunsali, "Characterization of Cement Kiln Dust-Activated Fly Ash and Slag as Alternative Binding Materials for Sustainable Concrete," *ACI Fall Convention*, New Orleans, USA, November 2009.

## Invited Talks

- [1] Beneficial Utilization of Indian Biomass in Eco-Friendly Bricks, *Engineered Materials for Sustainable Structures*, International Online Workshop, Modena, Italy, April 26, 2021.
- [2] Thermodynamic Modeling of Cement Hydration, *Online FDP on State-of-the-Art Experimental and Numerical Techniques in Civil Engineering*, Saintgits College of Engineering, Kottayam, Kerala, March 4, 2021.
- [3] Petrography Analysis of Concrete, *Advanced Course on “Forensic Analysis of Concrete Structures” (FACS’21)*, CSIR-SERC, Chennai, Feb 11, 2021.
- [4] Enhancing Sustainability and Durability Using CSAB Cement, *Short Term Training Program on Advanced Concepts in Materials and Structural Engineering*, SRM Institute of Science and Technology, Kattankulathur, Nov 21, 2020.
- [5] Microstructural and Mineralogical Characterization of Cementitious Materials, *Innovative Teaching Methods on Recent advances in Concrete And Sustainable Technologies (ReCAST)*, NIT Warangal, July 3, 2020.
- [6] Value Addition to Concrete Using Wastes and Residues, *RILEM Online Conference on Advances in Science and Technology of Concrete*, May 2, 2020.
- [7] Shrinkage Induced Distress in Concrete and Remedies, *Webinar Series to Promote Quality Promotion*, KHRI, Kerala, April 30, 2020.
- [8] Sustainable Masonry from Biomass Ash: Opportunities and Challenges, *BITS Pilani, Hyderabad*, Nov 2019.
- [9] Enhancing Sustainability and Durability Using Calcium Sulfoaluminate-Belite Cements, *Department of Chemical Engineering, University of Edinburgh, UK*, June 10, 2019.
- [10] Cement, Fly Ash and Slag: Reaction Mechanism and Advantages, *3-Day Training Program on Advanced Concrete Technology, Kerala Highway Research Institute, Karyavattom, Trivandrum, India*, Nov 7-9, 2018.
- [11] Calcium Sulfoaluminate Cement-Based Binder: Properties and Application, *Indian Concrete Institute (ICI) – Innovative World of Concrete (IWC)*, Bengaluru, India, Sept 19-22, 2018.
- [12] Cement Chemistry, Pozzolanic Materials, and Alternate Binders, *3-Day Summer School On Low Clinker, High Performance Cement Composites*, IIT Bhubaneswar, India, June 13-15, 2018.
- [13] Achieving Sustainability and Durability of Concrete Using Calcium Sulfoaluminate Cements, *Department of Civil Engineering, University of Cuenca, Ecuador*, Sept 2017.
- [14] Sustainable Masonry from Biomass Ash, *Department of Civil Engineering, University of Cuenca, Ecuador*, Sept 2017.
- [15] Early-Age Hydration and Volume Change of Calcium Sulfoaluminate Cement-Based Binders, *Construction Materials Seminar of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, USA*, February 2015.

## Teaching at IIT Madras

- Concrete Technology (CE 3420)
- Modern Construction Materials (CE 5010)
- Advanced Concrete Technology (CE 6010)
- Characterization of Construction Materials (CE 5950) [[Offered NPTEL Course with Prof. Manu Santhanam](#)]
- Cement Chemistry (CE 6040) [[New Graduate Course Introduced at IIT Madras](#)]

## Research Grants

- [1] Evaluation of Calcium Sulfoaluminate Cement as an Alternative Cementitious Binder, Value: Rs. 5 lakhs, NFIG, IIT Madras, 2018–2020. (PI: [Prof. Piyush Chaunsali](#))
- [2] Sustainability of Novel Cementitious Binders Derived from Industrial Byproducts, Value: 35.49 lakhs, SPARC, MHRD, 2019–2021. (PI: [Prof. Piyush Chaunsali](#); co-PI: Prof. Ravindra Gettu)

- [3] Novel Cementitious Materials for Enhancing Sustainability and Durability of Infrastructure, Value: 28 lakhs, NFSG, IIT Madras, 2019–2022. (PI: Prof. Piyush Chaunsali)
- [4] A New Framework of High Value Added Zero-waste Recycling of Concrete from Construction and Demolition Waste, Value: 33.8 lakhs, DST UKIERI, 2019–2021. (PI: Prof. Ravindra Gettu; co-PIs: Prof. Piyush Chaunsali and Prof. Surender Singh)
- [5] Beneficial Utilization of Agricultural (Stubble) Waste in Structural Materials, Value: 36 lakhs, Tide Water Oil India Ltd., 2020–2023. (PI: Prof. Piyush Chaunsali; co-PI: Prof. Manu Santhanam)
- [6] Performance Evaluation of Biomass Ash Binders for Building Applications, Value: 3.72 lakhs, Saint Gobain Research India, 2020–2021. (PI: Prof. Piyush Chaunsali)
- [7] Utilization of Biomass as an Alternative Fuel for SCM Processing, Value: 20.76 lakhs, FLSmidth Ltd., 2020–2021. (PI: Prof. Varunkumar S.; co-PI: Prof. Piyush Chaunsali)
- [8] Development of Binders for E-Glass Reinforcement, Value: 88 lakhs, Lafarge-Holcim Ltd., 2021–2024. (PI: Prof. Ravindra Gettu; co-PI: Prof. Piyush Chaunsali)

**Mentorship at MIT/UIUC**

- Hugo Uvegi (PhD Student, MIT)
- Rachel Osmundsen (Undergraduate, MIT)
- Di Wu (MS Student, UIUC)
- Xiazhi Zhang (Undergraduate, UIUC, REU Program)
- Haiyang Zhao (Undergraduate, UIUC, REU Program)
- Daniel Borup (Undergraduate, UIUC)
- Illan Cohn (Undergraduate, UIUC)

**Current Students at IIT Madras**

- **Ph.D. Students:** S. Vaishnav Kumar (June 2018 –), Tom Damion (July 2018 –), NilaKanmani M. (Jan 2020 –), Paul Shaji (Jan 2020 –), Bipina T.V. (Sept 2020–)
- **M.S. Students:** K.V.C. SaiSri (co-guide; Sept 2020 –)
- **M.Tech. Students:** Atul Sharma (Aug 2020 –)
- **Dual Degree Students:** Chandrashekhar Mathuria (Aug 2020 –)

**Former Students at IIT Madras**

- Varun Choudhary (Dual Degree Student, 2019 – 2020)

**Short Term Courses/Workshops**

- Organized (with Prof. Ravindra Gettu) *International Symposium on Concrete Construction and Preservation* in Chennai on Dec 18, 2018.
- Organized Short Term Course on *Advanced Concrete Technology* at IIT Madras during Nov 18–23, 2019.
- Organized SPARC Workshop (with Profs. Ravindra Gettu, Manu Santhanam, Radhakrishna G. Pillai) on *Sustainability and durability of concrete structures with by-products and recycled materials* at IIT Madras Research Park during Jan 17-18, 2020.

**Professional Societies**

- Member of American Concrete Institute (ACI)
- Member of American Society of Civil Engineers (ASCE)
- Member of RILEM
- Life Member of Indian Concrete Institute (ICI)

**Editorial Board**

Associate Editorship of ASCE Journal of Materials in Civil Engineering (June 2020 –)

**Journal Referee** ACI Materials Journal, Advances in Cement Research, Cement and Concrete Research, Cement and Concrete Composites, Construction and Building Materials, Case Studies in Construction Materials, Indian Concrete Journal, Journal of Materials in Civil Engineering, Journal of Building Engineering, Journal of Advanced Concrete Technology, Journal of Sustainable Cement-Based Materials, Materials and Structures, Sādhanā, Structural Concrete