Jianqiang Sky Zhou, Ph.D.

Data / Computer Vision Scientist

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https://github.com/mxz2013
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Chinese, holding the Carte de Résident de Longue Durée - UE

EXPERIENCE

2021 – now **Senior Solution Scientist** at Flyinstinct.

2020 – 2021 **Solution Scientist** at Flyinstinct.
A startup provides a digital platform for airport inspections developed with the most advanced technologies of computer vision and AI algorithm.

- Proof of concept: Design new algorithms based on computer vision technique. Implement them in Python, and prove their performance in our industrial products.
- Data analysis: Extract information from images, analyze them according to the requirement of the products, which helps to design better algorithms.
- Software team lead: explain and discuss daily tasks and distribute daily work. Provide the best direction to go for product development based on team members' ability.
- Pipeline performance evaluation : Study the performance of the entire pipeline. Design in-house experiment for evaluating potential problems or bugs.

2018 – 2020 **Post-doctoral Fellow** Sorbonne Université, Institut des Nanosciences de Paris.
Supervisor: Matteo Calandra

- Applied a machine-learning type approach (minimize the gradients of the energy using conjugate gradient or steepest descent algorithm) to compute physical concepts.

2016 – 2018 **Post-doctoral Fellow** Laboratoire des Solides Irradiés, École Polytechnique.
Supervisor: Lucia Reining

- Developed mathematical methods and implemented it in a software (in Python) for bleeding-edge numerical simulations, leading to several top-tier peer-reviewed publications. See details at https://github.com/mxz2013/CumuPy.
- Proposed and participated an bleeding-edge experiment to confirm my theoretical predictions, with collaborations with researchers from different domains, and different countries.
- Received 3 invitations for giving a seminar on my researching projects, and published one article which applies probability theory in physics.
- Organized ETSF correlation team meeting at École Polytechnique, France (+30 participants worldwide).

SKILLS

Languages English, Chinese, French.

Data science Programming & Database: Python, Wolfram Mathematica, Fortran, Bash, SQL.
Computer Vision: OpenCV.
Development & Maintenance: Git, SVN.
Editor: VI, Pycharm, Jupyter Notebook, LaTeX, Microsoft Office.
Math & Statistics: Machine learning, deep learning, quantitative research.

Soft skills Problem solver, passionate about data analysis, curious about new technology, story-telling (presentation), strong sense of responsibility (family and work), planing and organization.

EDUCATION

2013 – 2016 **Ph.D. in Theoretical Physics**, École Polytechnique, France.
Supervisor: Lucia Reining

- Led multiple joint projects producing several top-tier peer-reviewed publications;
- Developed mathematical methods beyond state of the art for the analysis of solids, implemented them into scientific computing software.
- Participated 10 international conferences with 7 oral presentations and 3 posters (with one best poster prize).
- Co-organized the 12th ETSF Young Researchers' Meeting in Paris, France (+70 participants worldwide).

2010 – 2012 **M.Sc. in Erasmus Mundus - Master of Molecular Nano- and Biophotonics for telecommunications and biotechnologies (MONABIPHOT)**, École Normale Supérieure de Cachan, France. **Titre avec la mention BIEN**.

- Won the Erasmus Mundus Scholarship (48K € for a two-year study in Europe).
- Acquired multidisciplinary knowledge on biology, chemistry, and physics.

2005 – 2009 **B.Sc. in Optoelectronic Engineering**, Harbin institute of technology, China. **GPA: 85/100 .**

ACADEMIC PUBLICATIONS

High impact journal articles

1. **Zhou, J. S.**, Bianco, R., Monacelli, L., Errea, I., Mauri, F. & Buonaura, M. C. (2020). Theory of the thickness dependence of the charge density wave transition in 1t-tite2. *2D Materials*. http://iopscience.iop.org/10.1088/2053-1583/abae7a
2. **Zhou, J. S.**, Monacelli, L., Bianco, R., Errea, I., Mauri, F. & Calandra, M. (2020). Anharmonic melting of the charge density wave in single-layer $TiSe_2$. *Nano Letters*, *20*(7), 4809–4815. PMID: 32496779. doi:10.1021/acs.nanolett.0c00597
3. **Zhou, J. S.**, Reining, L., Nicolaou, A., Bendounan, A., Ruotsalainen, K., Vanzini, M., … Gatti, M. (2020). Unraveling intrinsic correlation effects with angle-resolved photoemission spectroscopy. *Proceedings of the National Academy of Sciences*. https://www.pnas.org/content/117/46/28596
4. Borgatti, F., Berger, J. A., Céolin, D., **Zhou, J. S.**, Kas, J. J., Guzzo, M., … Egdell, R. G. (2018). Revisiting the origin of satellites in core-level photoemission of transparent conducting oxides: The case of n-doped SnO2. *Phys. Rev. B*, *97*, 155102. doi:10.1103/PhysRevB.97.155102.
5. Gonze, X., **Zhou, J. S.** & Reining, L. (2018). Variations on the "exact factorization" theme. *The European Physical Journal B*, *91*(10), 224. doi:10.1140/epjb/e2018-90278-2.
6. **Zhou, J. S.**, Gatti, M., Kas, J. J., Rehr, J. J. & Reining, L. (2018). Cumulant green's function calculations of plasmon satellites in bulk sodium: Influence of screening and the crystal environment. *Phys. Rev. B*, *97*, 035137. doi:10.1103/PhysRevB.97.035137.
7. **Zhou, J. S.** et al. (2015b). Dynamical effects in electron spectroscopy. *The Journal of Chemical Physics*, *143*(18), 184109. doi:10.1063/1.4934965.
8. Zhou, Y. P., Chang, G. L., **Zhou, J. S.** et al. (2009). Gamma-ray irradiation effects on distributed-feedback laser diodes. *Journal of Russian Laser Research*, *30*(2), 164–171.

Conference talks

1. **Zhou, J. S.** (2019). Photoemission spectroscopy from first principles. In ***(Invited)*** *seminar by the materials and nanosciences research department of the institute of physics, rennes i university*, Rennes, France.
2. **Zhou, J. S.** et al. (2019a). Charge density wave in mono-layer TiSe2. In *16th ETSF young researchers' meeting*, San Sebastian, Spain.
3. **Zhou, J. S.** (2017a). Challenges for the cumulant approach in valence photoemission of metals. In ***(Invited)*** *by CECAM workshop: Green's function methods: The next generation III*, Toulouse, France.
4. **Zhou, J. S.** (2017b). Photoemission spectroscopy from first principles. In ***(Invited)*** *by mini-workshop "REST in Paris"*, Paris, France.
5. **Zhou, J. S.** et al. (2015a). Alternative routes for calculations of total energies. In *Psi-k 2015 conference*, San Sebastian, Spain.
6. **Zhou, J. S.** & Reining, L. (2015a). An improved description of fermion-plasmon coupling in green's function calculations. In *13th ETSF young researchers' meeting*, London, UK.
7. **Zhou, J. S.** & Reining, L. (2015c). Improved description of electron-plasmon coupling in Green's function calculations. In *APS March meeting 2015*, San Antonio, Texas.
8. **Zhou, J. S.** & Reining, L. (2014a). Improved description of electron-plasmon coupling in Green's function calculations. In *11th ETSF young researchers' meeting*, Rome, Italy.
9. **Zhou, J. S.**, Rödl, C. & Reining, L. (2012). Exploring the performance of the cumulant expansion for the two-site hubbard model. In *9th ETSF young researchers' meeting*, Brussels, Belgium.