

Spatially-Explicit Learning to Address Spatial Variability

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Spatial Variability

- One size AI does not fit all

Which is snow?

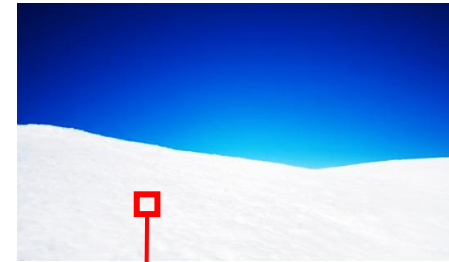
Credit: Dr. Shashi Shekar, UMN



Runn of Kutch, Gujarat, India



White Sands, NM, USA



Snow

255, 255, 255

Salt

255, 255, 255

Sand

255, 255, 255

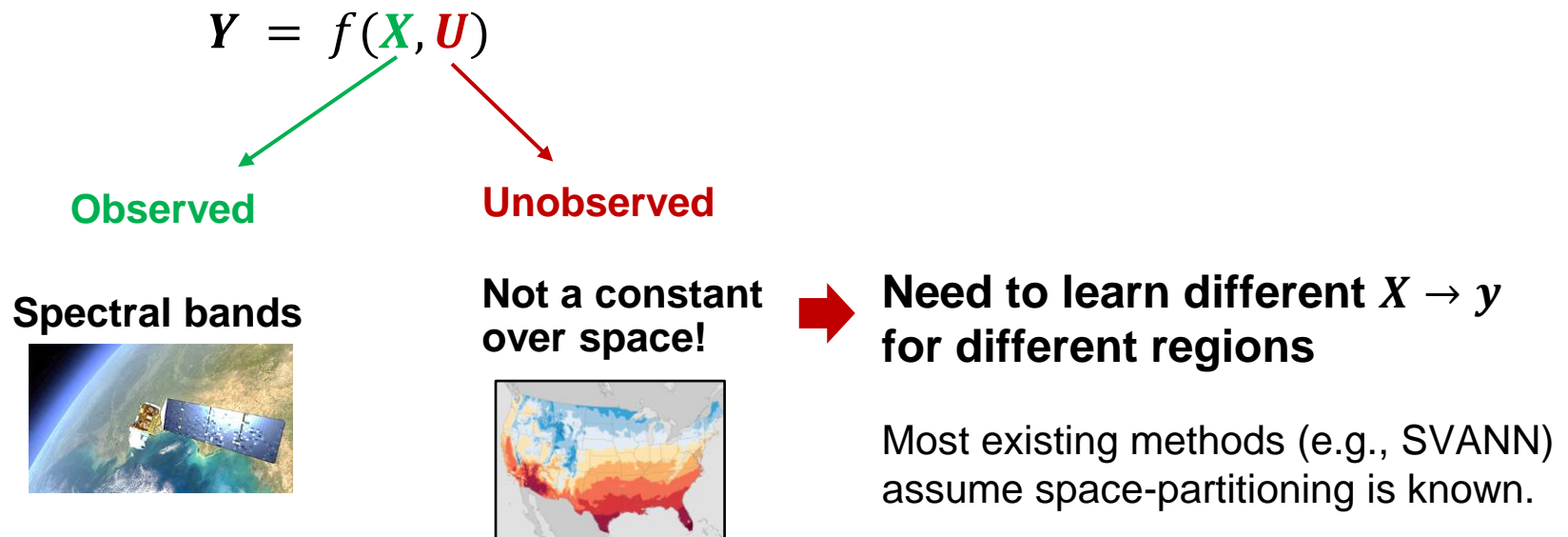
Snow

Confusion

$X \rightarrow y$ is different!

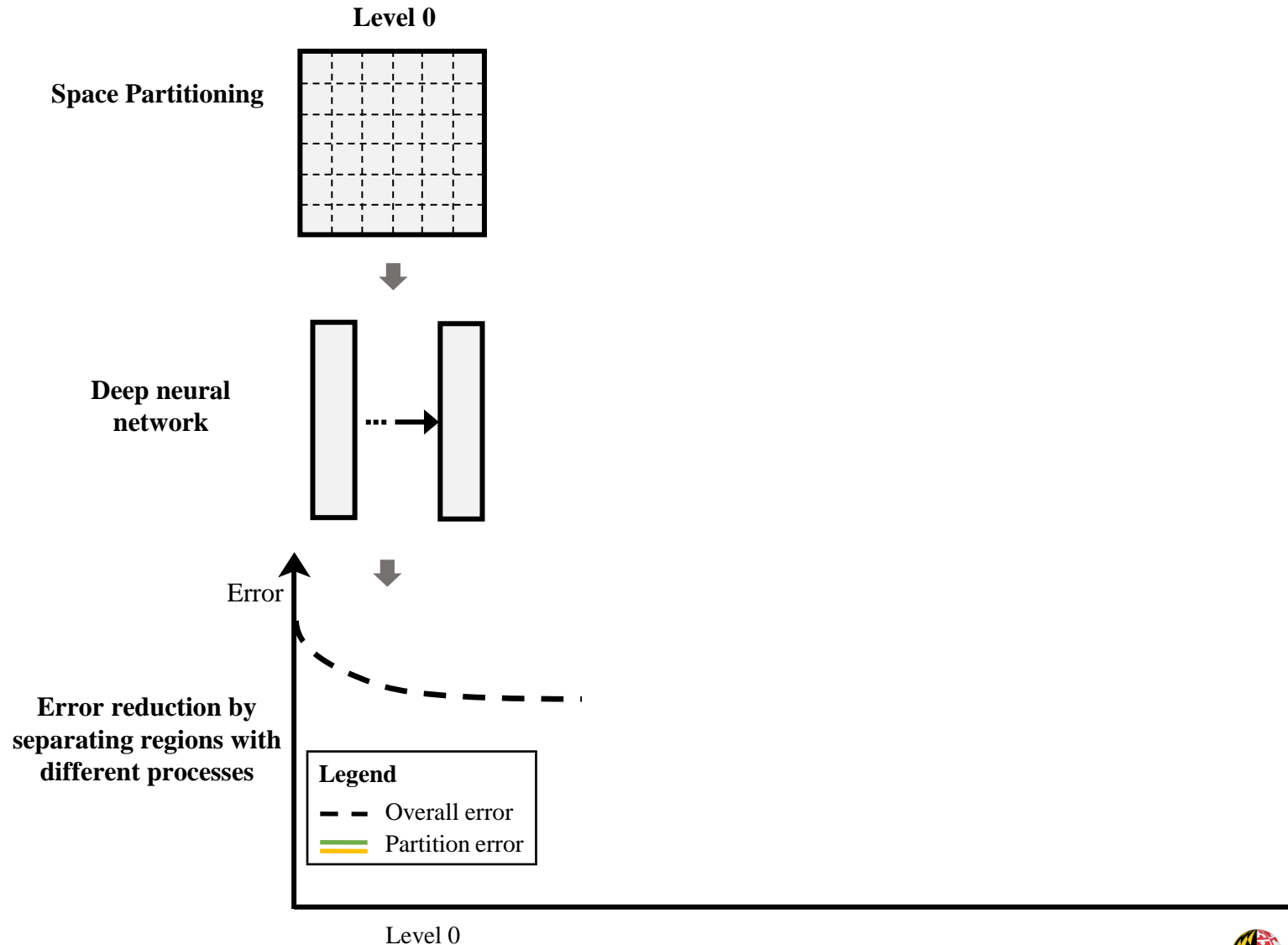
Spatial Variability

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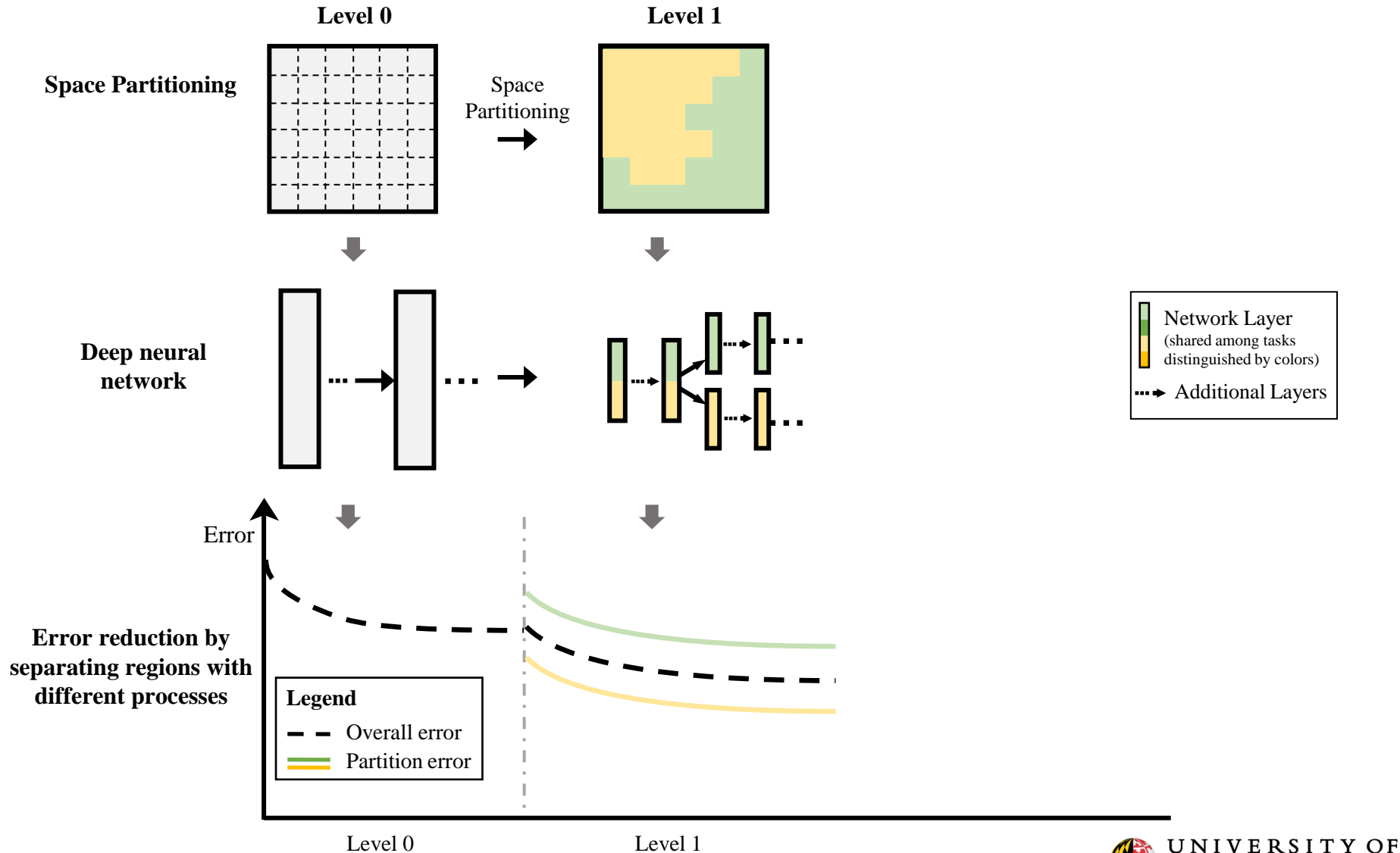


1. Yiqun Xie, Erhu He, Xiaowei Jia, et al. A Statistically-Guided Deep Network Transformation and Moderation Framework for Data with Spatial Heterogeneity. IEEE International Conference on Data Mining (ICDM'21), 2021.
2. Goodchild, M.F. and Li, W., 2021. Replication across space and time must be weak in the social and environmental sciences. *Proceedings of the National Academy of Sciences*, 118(35), p.e2015759118.
3. Gupta, J., Molnar, C., Xie, Y., Knight, J. and Shekhar, S., 2021. Spatial variability aware deep neural networks (SVANN): a general approach. *ACM Transactions on Intelligent Systems and Technology (TIST)*, 12(6), pp.1-21.

Heterogeneity-Aware AI



Heterogeneity-Aware AI



Heterogeneity-Aware AI



Best Paper Award,
IEEE Intl. Conf. on
Data Mining

