UNIVERSITY OF TWENTE.

SEASONAL RETRIEVAL OF LEAF TRAITS ACROSS CANOPY USING PROSPECT MODEL

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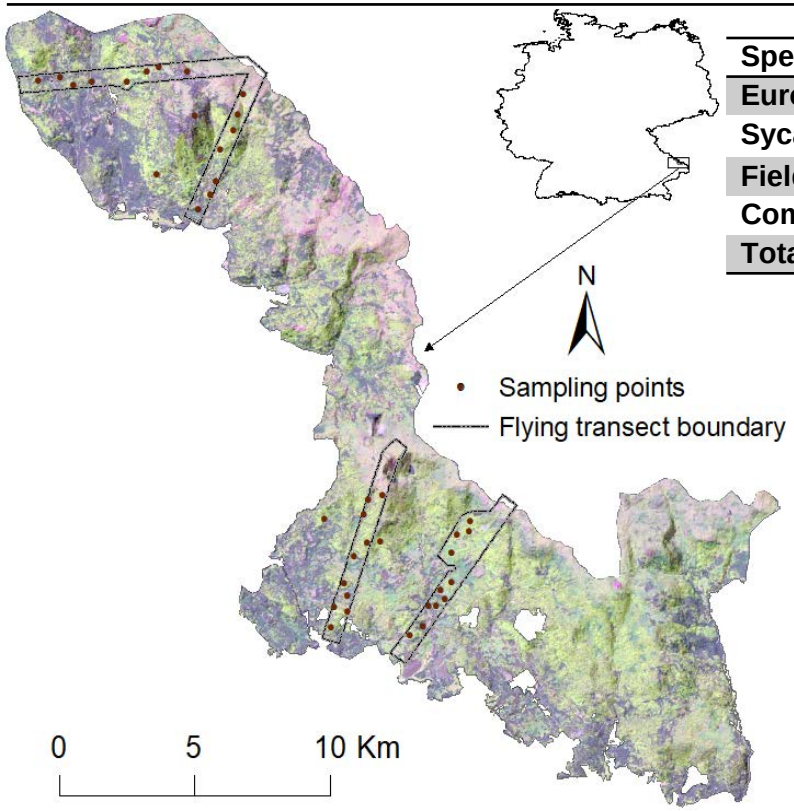
INTRODUCTION

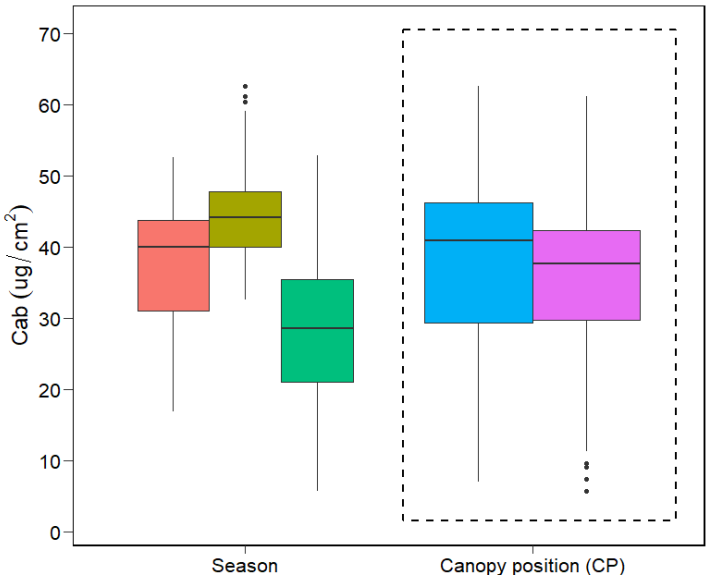
- Seasonal variation in leaf traits across the canopy - ecosystem structure and functioning
- Leaf traits change as a function of leaf phenological stage and canopy light environments – sunlit and shaded canopy
- Studies on seasonal and across canopy retrieval of leaf traits using the PROSPECT model are lacking
- Compare spectral match between measured and PROSPECT simulated reflectance spectra
- Assess the seasonal performance of the PROSPECT model in retrieval of C_{ab} across the canopy

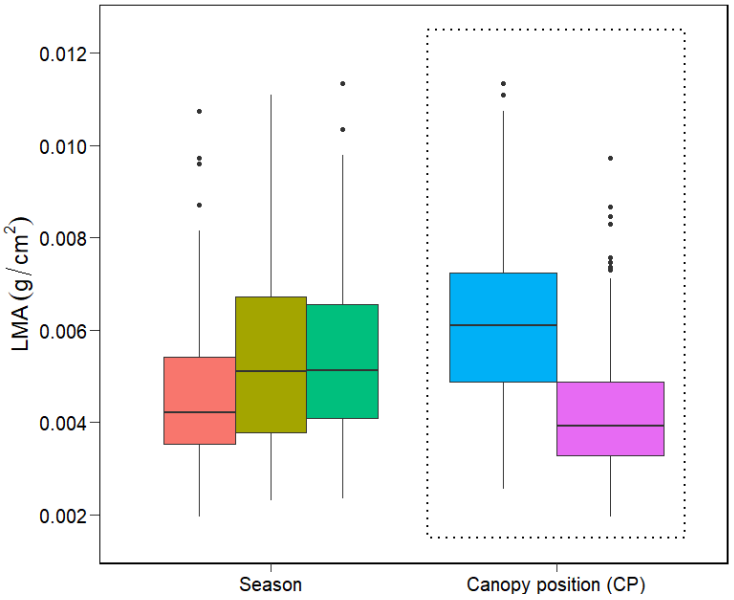
SAMPLES ACROSS SEASONS

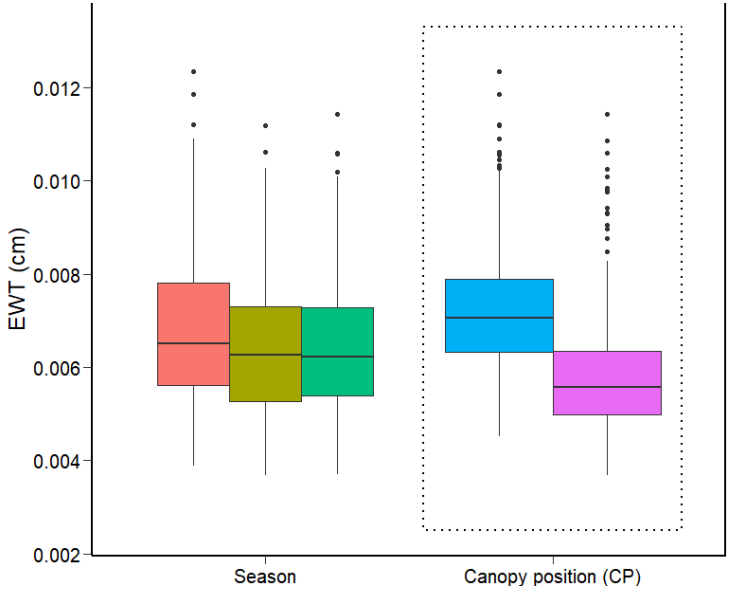


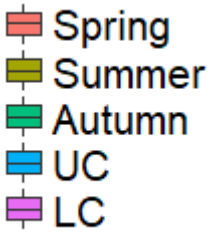
Species	Spring	Summer	Autumn	Total
European beech	156	194	196	546
Sycamore maple	6	12	12	30
Field elm	2	2	2	6
Common rowan	2	2	2	6
Total	166	210	212	588

MATERIAL AND METHODS





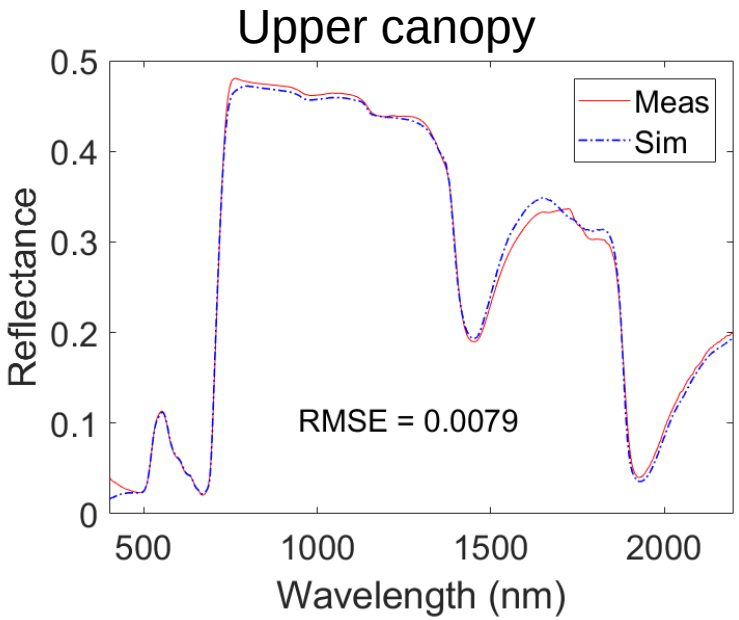


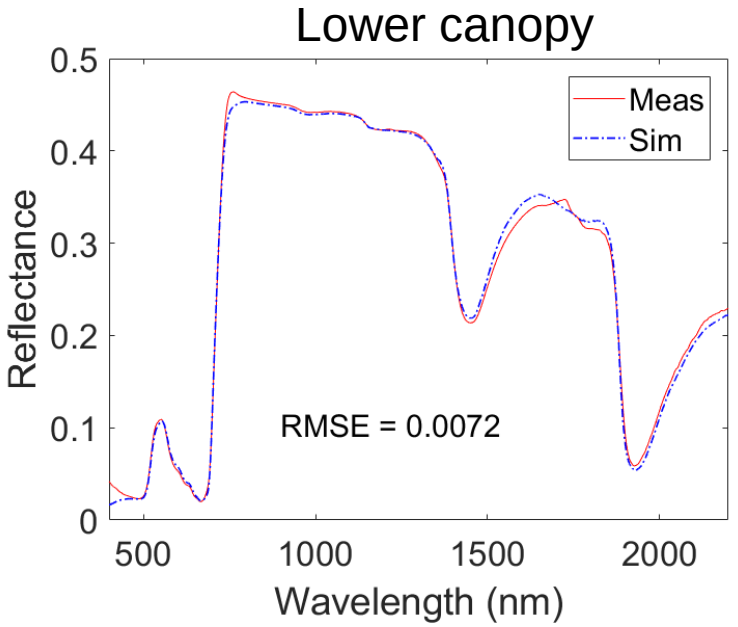


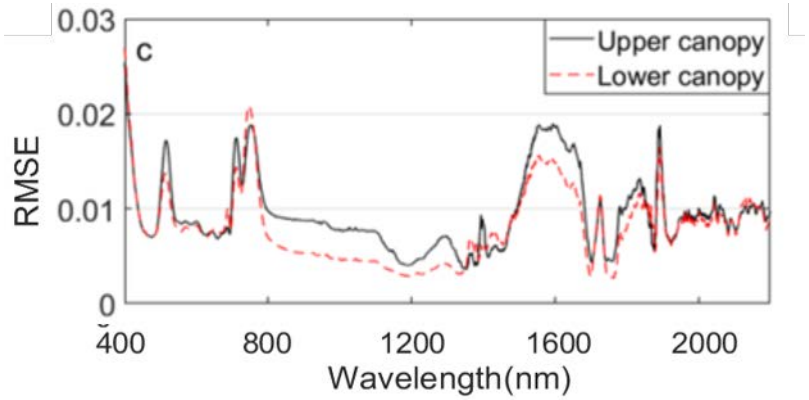
CALIBRATION OF THE PROSPECT MODEL

Parameter	unit	min	max	mean	SD
Leaf structure parameter (N)	---	1	2.22	1.52	0.15
Total leaf chlorophyll content (C_{ab})	µg/cm^2	2	67	36.57	10.6
Equivalent water thickness (Cw)	cm	0.0025	0.015	0.0015	0.0066
Leaf mass per area (Cm)	g/cm^2	0.0015	0.014	0.0016	0.0053

PRELIMINARY RESULTS







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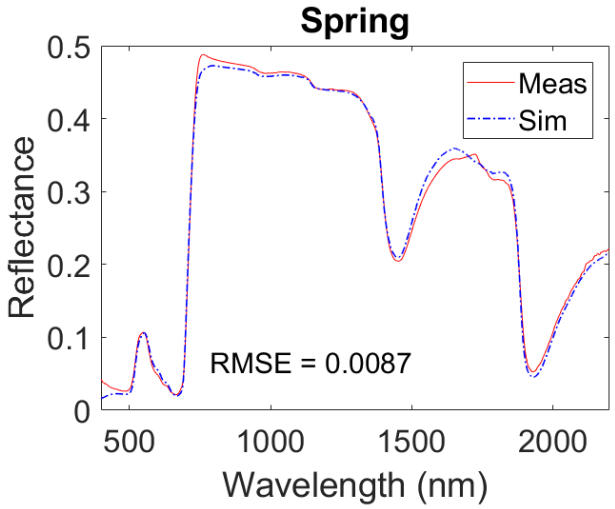

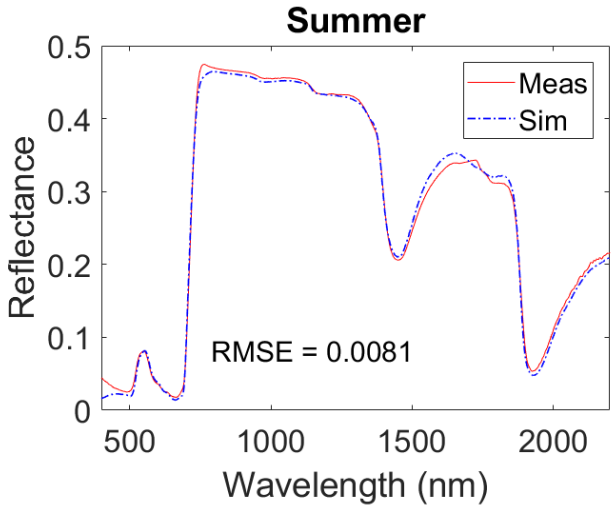

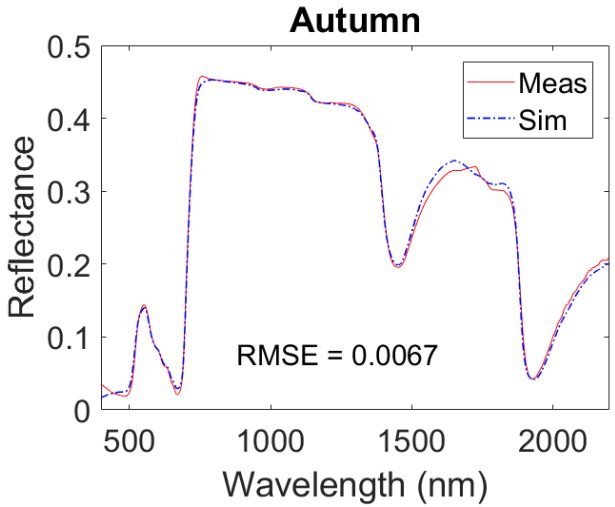

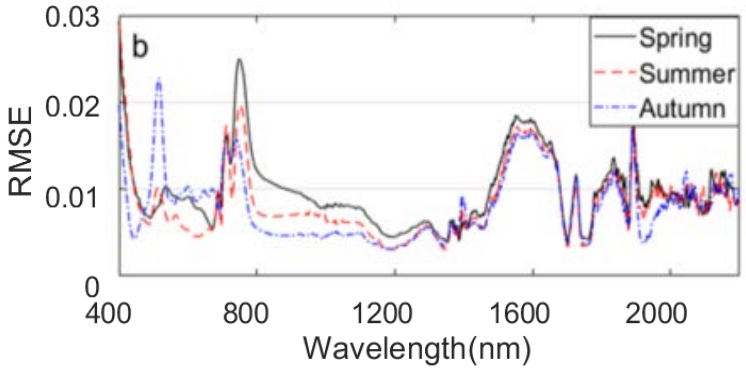

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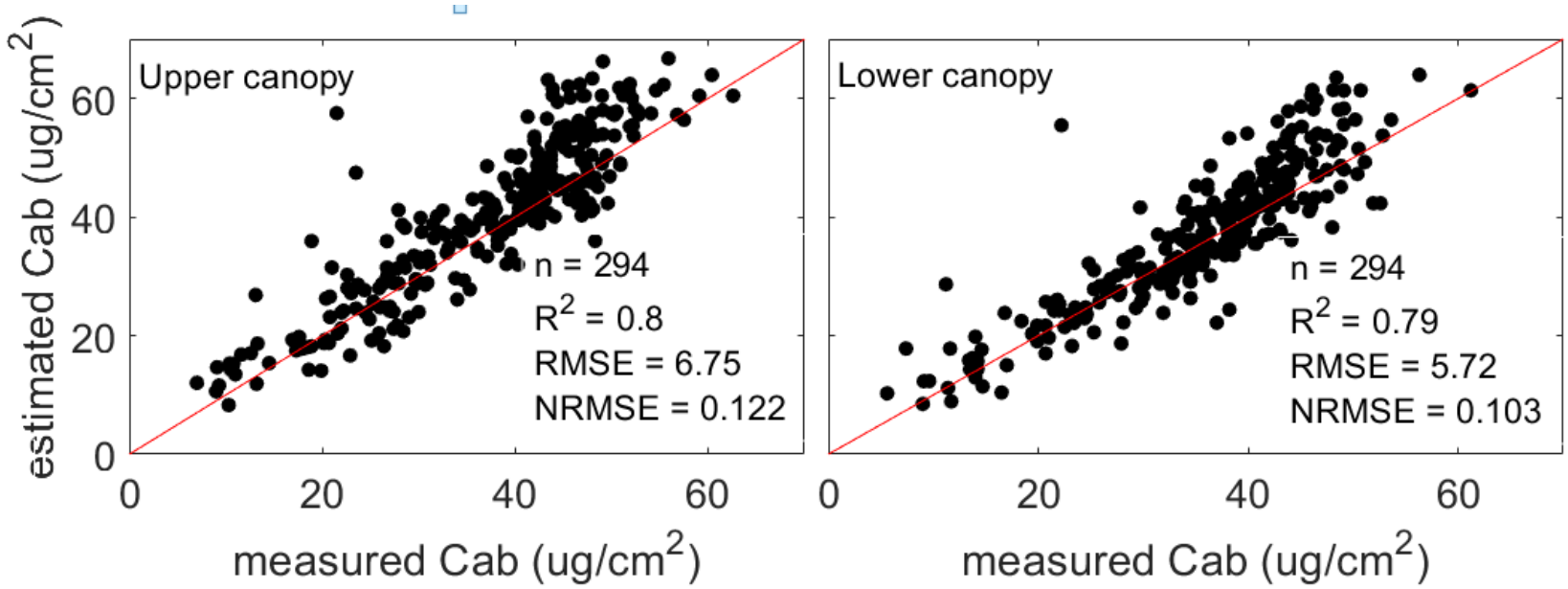
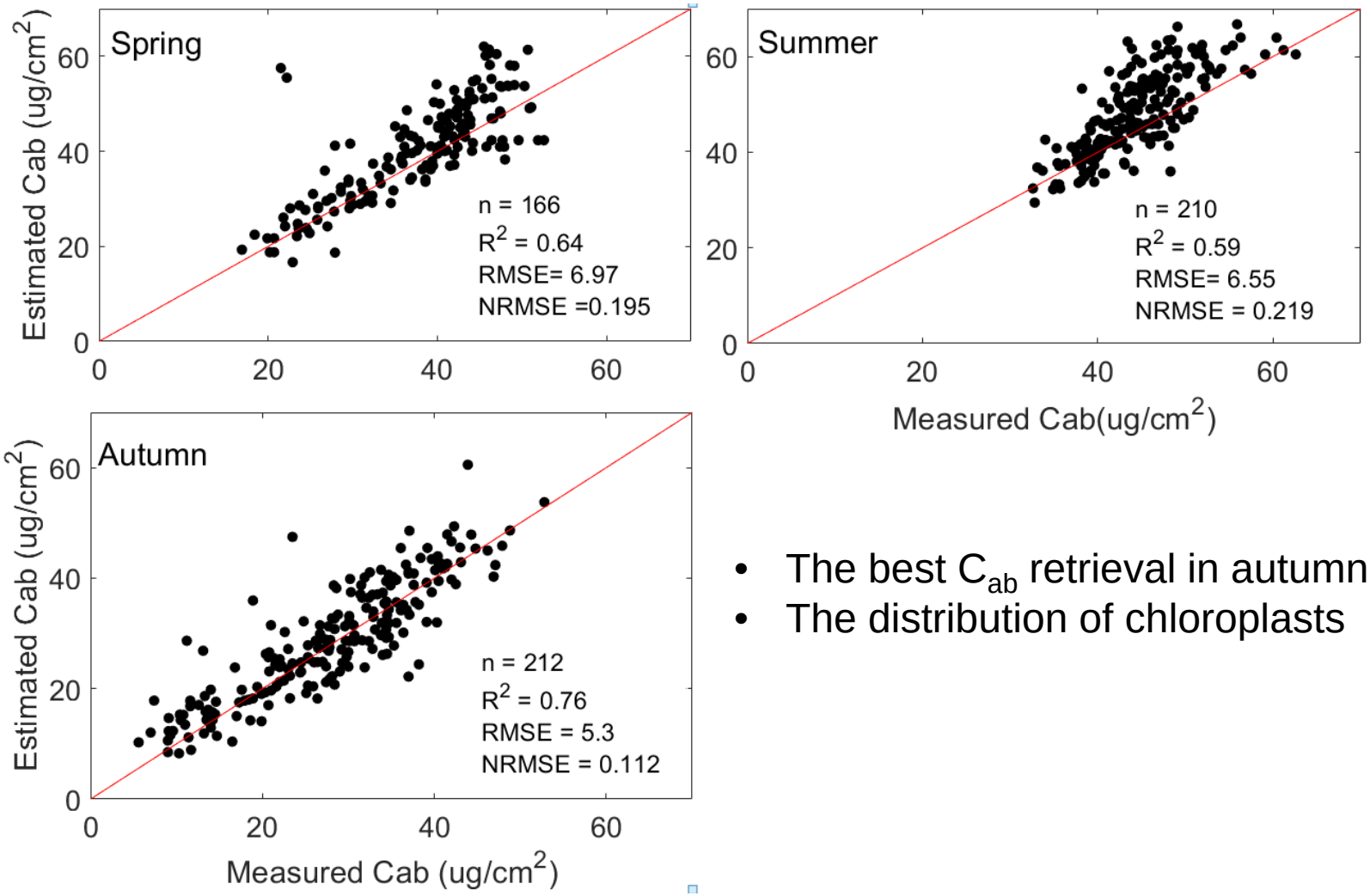


- Lower canopy Cab retrieved better to upper canopy
- Changes in leaf morphological traits, i.e. SLA and LMA

PRELIMINARY RESULTS



- The best C_{ab} retrieval in autumn
- The distribution of chloroplasts

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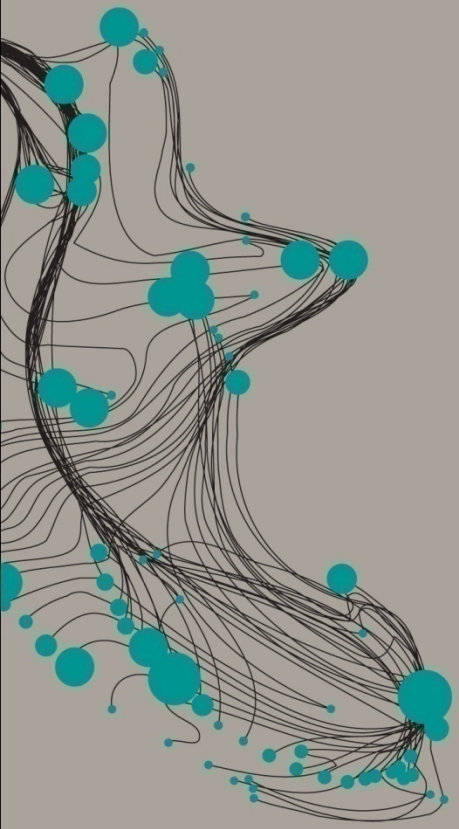

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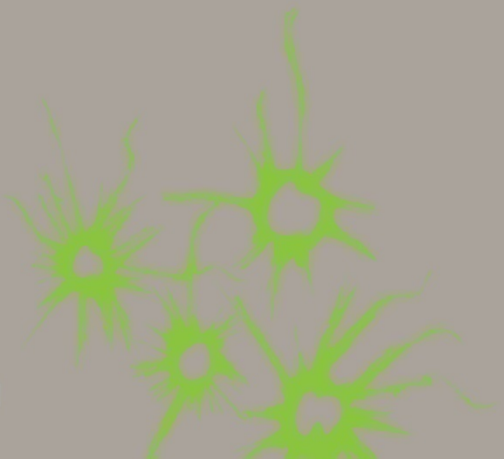

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