

Program Optimisations via Hylomorphisms for Extraction of Executable Code

David Castro-Perez, Marco Paviotti, and Michael Vollmer

d.castro-perez@kent.ac.uk

ITP 2025



Why Hylomorphisms in Rocq

Folds as Initial Algebras

Hylomorphisms

Folds/Unfolds as Hylomorphisms

Challenges for Encoding Hylos in Rocq

Roadmap

Containers

Containers: Example

Container Mechanisation for Clean Extraction

(Co)algebras & (co)fixpoints

Recursive Coalgebras

Recursive Hylomorphisms

Hylomorphism Fusion

Example: Quicksort Extraction

Example: Dynamorphisms

Summary & Future Work