

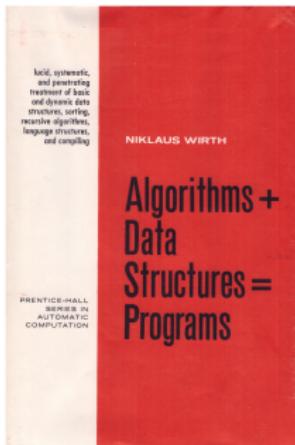
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2018



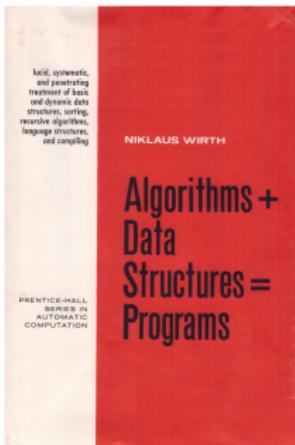
Abstract Data Types [Liskov:VHLL74]

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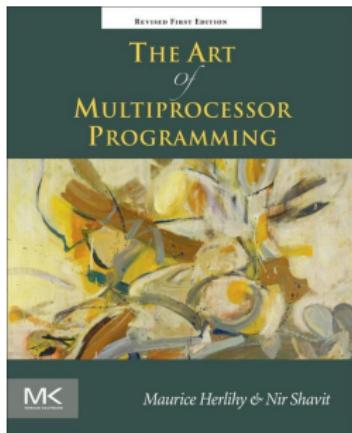
Abstract Data Types [Liskov:VHLL74]

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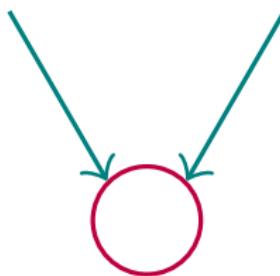
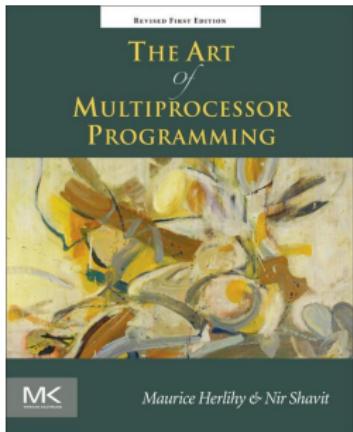
Concurrent Data Types [Herlihy:TOPLAS90]

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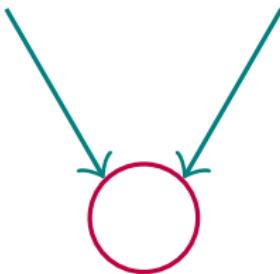
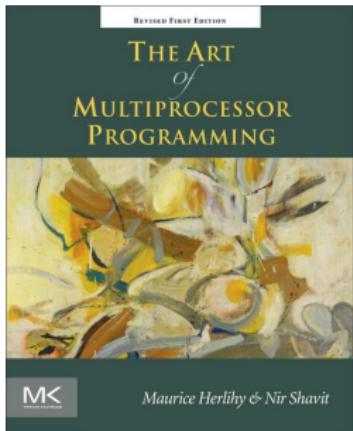
Concurrent Data Types [Herlihy:TOPLAS90]

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Concurrent Data Types [Herlihy:TOPLAS90]

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PL (Programming Language)

Replicated Data Types

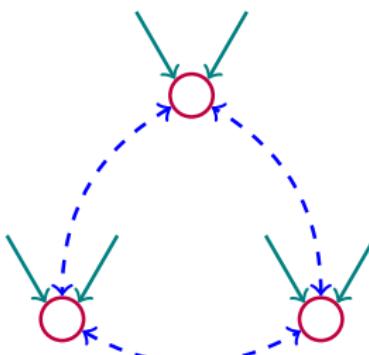
[Shapiro:TR11] [Burckhardt:POPL14]

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Replicated Data Types

[Shapiro:TR11] [Burckhardt:POPL14]

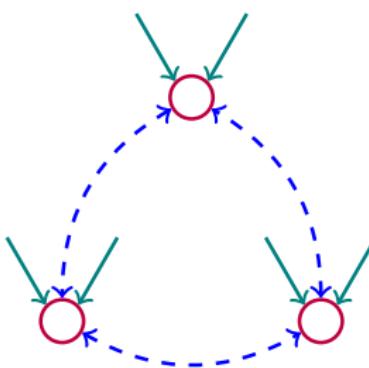
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Replicated Data Types

[Shapiro:TR11] [Burckhardt:POPL14]

(



DC (Distributed Computing)

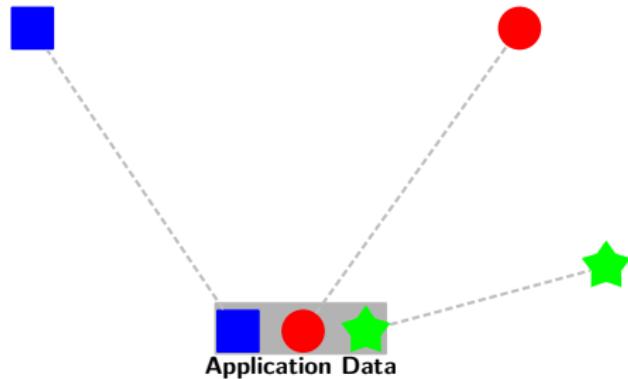




(4

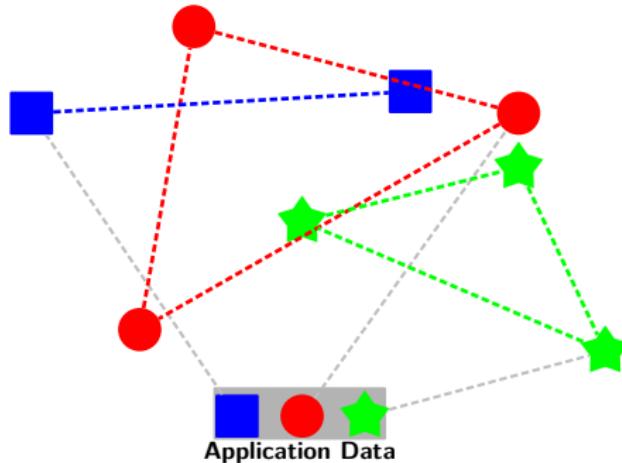


(distributed data):



(distributed data):

1. (partition):



(distributed data):

1. (partition):
2. (replication) :

[Shapiro:TR11]

- ▶ Read/Write Register
- ▶ Counter
- ▶ Set
- ▶ List
- ▶ HashMap
- ▶ Disjoint Set
- ▶ Graph
- ▶ ...



What's
new?





What's
new?



Replicated Data Types: Specification, Verification, Optimality

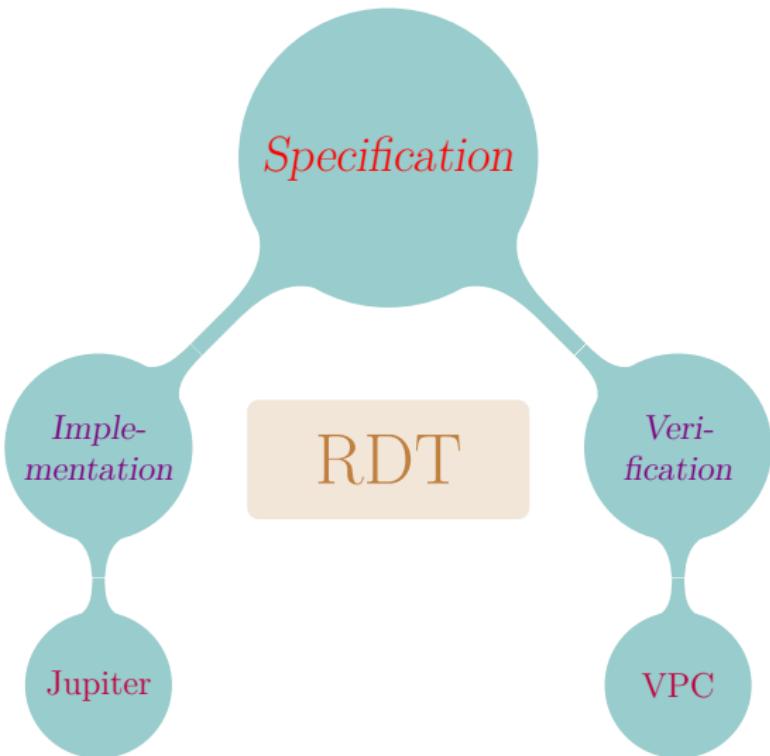
Sebastian Burckhardt

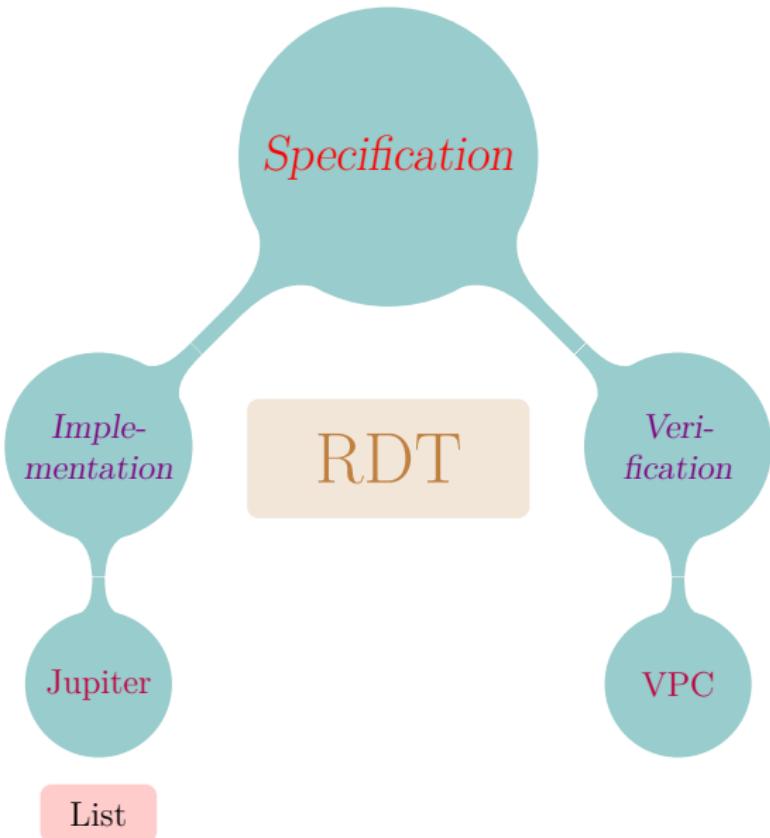
Alexey Gotsman

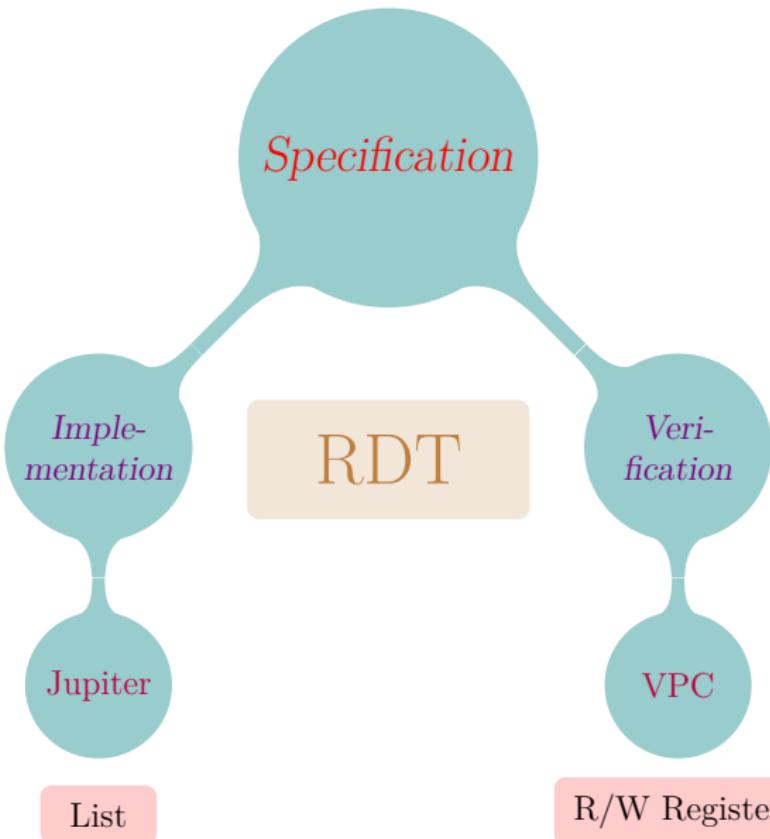
Hongseok Yang

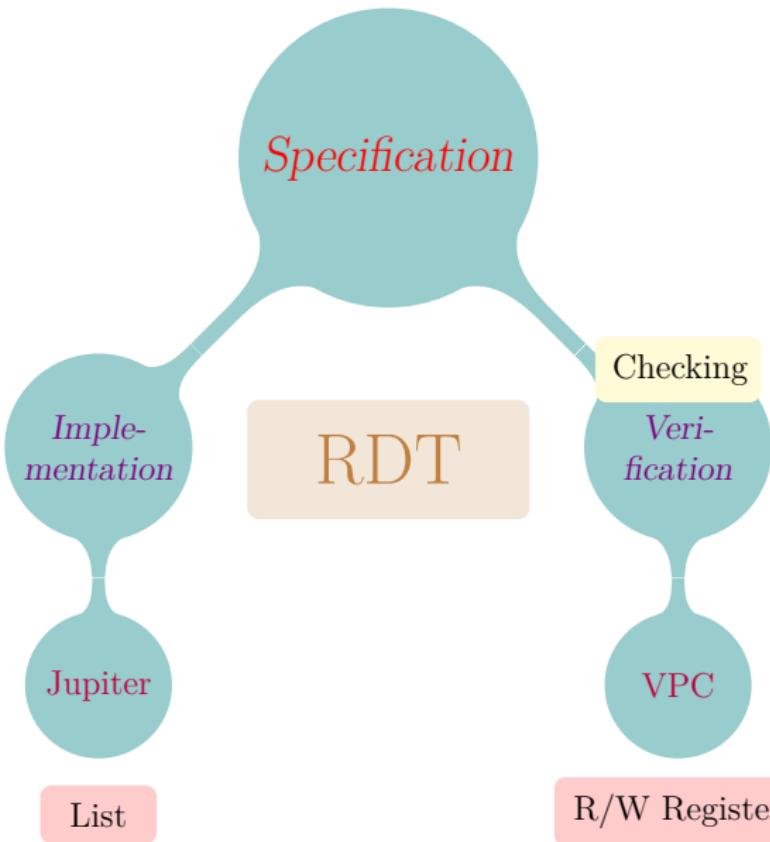
Marek Zawirski

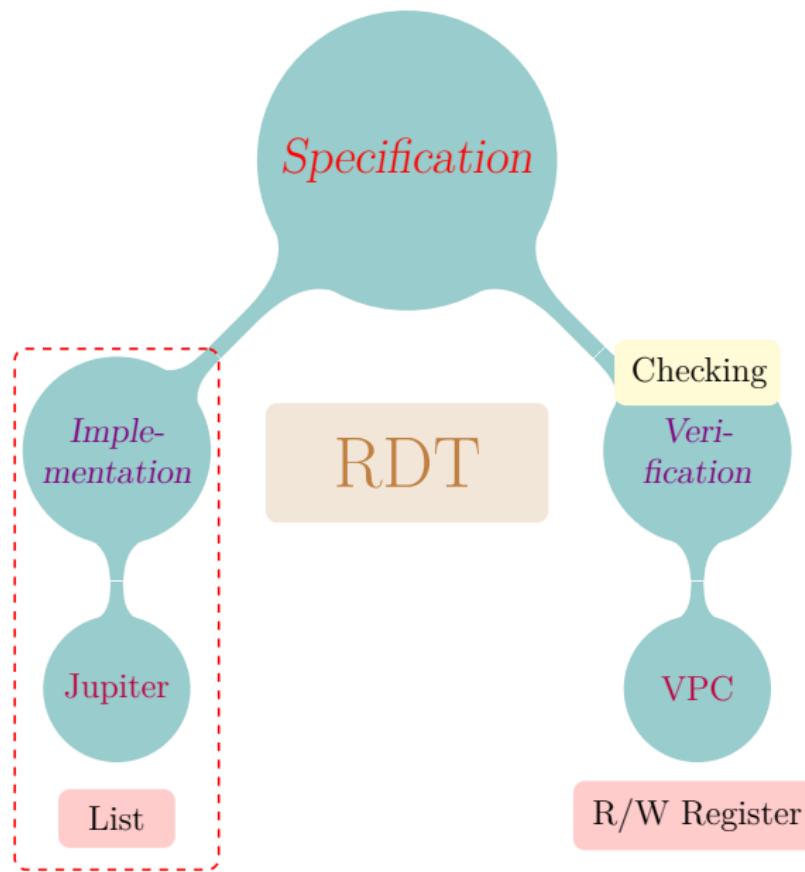
[Burckhardt:POPL14]











Brief Announcement @ PODC'2018 ¹

Jupiter [Nichols:UIST95]^a
weak list specification [Attiya:PODC16]^b.

^aNichols:UIST95.

^bAttiya:PODC16.

Brief Announcement @ PODC'2018 ¹

Jupiter [Nichols:UIST95]^a
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^aNichols:UIST95.

^bAttiya:PODC16.

Weak List Specification



(a) Google Docs



(b) Apache Wave



(c) Wikipedia

(d) L^AT_EX Editor

:

INS(a, p) : $p \ a$

DEL(p) : p

READ :

Specification and Complexity of Collaborative Text Editing

Hagit Attiya
Technion

Sebastian Burckhardt
Microsoft Research

Alexey Gotsman
IMDEA Software Institute

Adam Morrison
Technion

Hongseok Yang
University of Oxford

Marek Zawirski^{*}
Inria & Sorbonne Universités,
UPMC Univ Paris 06, LIP6

(Weak List Specification $\mathcal{A}_{\text{weak}}$ [Attiya:PODC16])

Informally, $\mathcal{A}_{\text{weak}}$ requires the ordering between elements that are not deleted to be consistent across the system.