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Facebook AI
@FIBBONNACI

AGENDA

01

PYTORCH

02

ECOSYSTEM

PYTORCH

An open source machine learning framework that accelerates the path from research prototyping to production deployment.

MACHINE LEARNING FRAMEWORK

- Primitives, activation and loss functions, optimizers

RESEARCH PROTOTYPING

- Models are Python code, Autograd and ‘eager’ mode for dynamic model architectures

PRODUCTION DEPLOYMENT

- TorchScript, TorchServe, quantization

PyTorch Open Source Community

- 1700+ contributors (+50% YoY)
- 37k users in discussion forums
- 57k+ GitHub downstream projects

PyTorch for Research

- Cited in 70% of NeurIPS'19 framework papers
- +127% YoY increase on Arxiv papers (Jun'19 to Jun'20)

Source: GitHub
Source: http://horace.io/pytorch-vs-tensorflow
Source: arxiv.org

The PyTorch Community

PYTORCH IN PRODUCTION

PyTorch in Production

- AstraZeneca, Disney, Datarock, Blue River Technology, Uber ATG, and more.

PyTorch in Production at Facebook

- Over 93% of models are trained on PyTorch
- Over 1700 inference models in production
- 600+ active users of PyTorch

Production Usage

WHO MAKES PYTORCH: THE FULL TIMERS (60%)

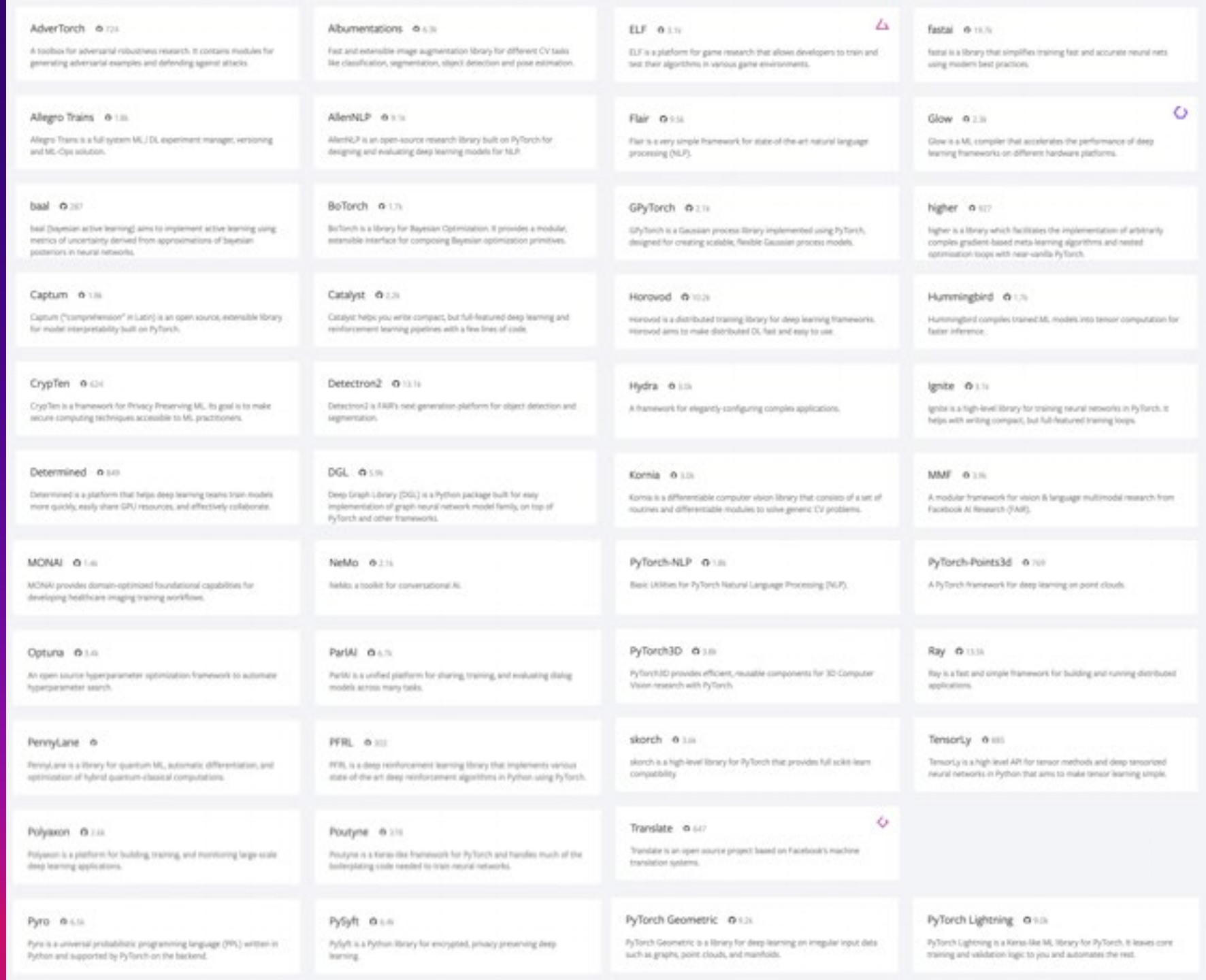
Nvidia	Intel	Quansight
Microsoft	AMD	IBM
Preferred Networks	Google	Amazon

WHO MAKES PYTORCH: EVERYBODY ELSE (40%)

Operators	Python/C++ API parity	ONNX
Data Loading	Complex Numbers	VSX support
ROCm	Linear Algebra	Many, many more

WHO MAKES PYTORCH: EVERYBODY ELSE (40%)

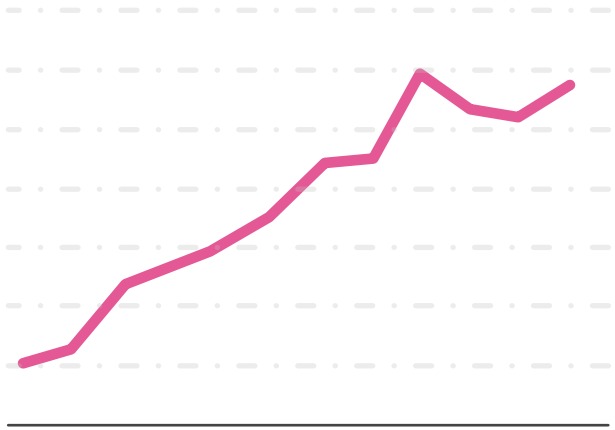
THE SCOPE OF PYTORCH ECOSYSTEM



WHAT DROVE ADOPTION?

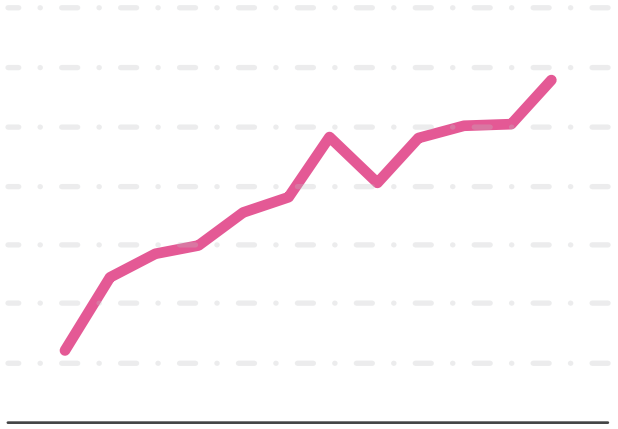
1. Usability

2. Production Usage



2X

EMPLOYEES TRAINING MODELS



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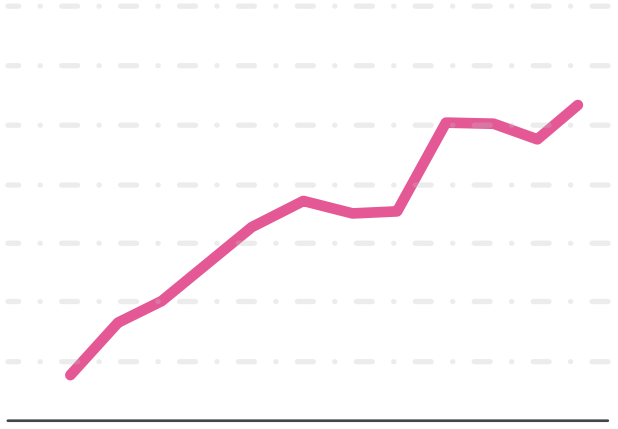
MODELS TRAINED

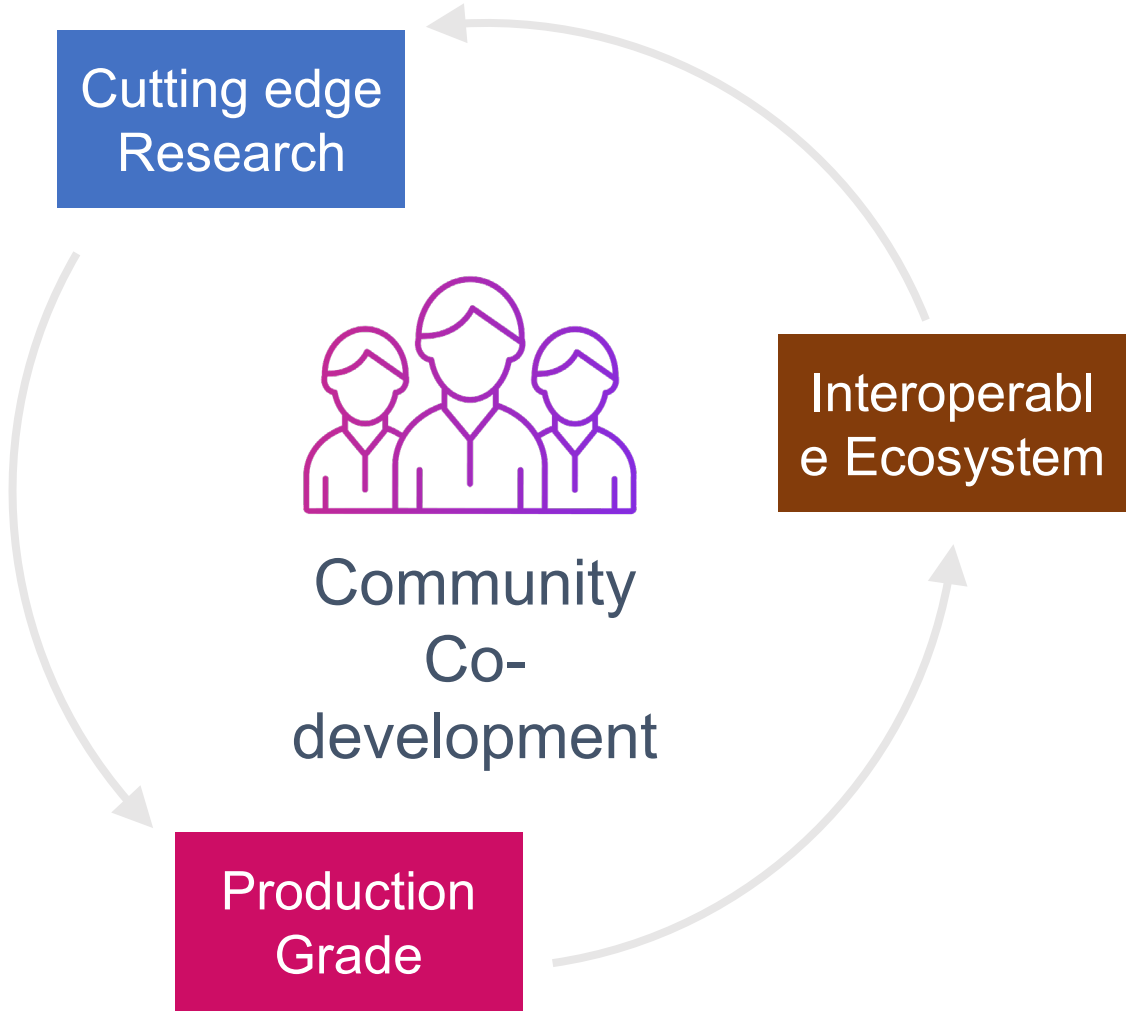


8X

COMPUTATIONAL RESOURCES

INTERNAL FB TRENDS OVER 18 MONTHS

Source: Internal Facebook Metrics


Cutting edge Research
Interoperabl e Ecosystem
Production Grade
Community Co-development

Flexibility for fast ideation and breakthrough

Cutting edge Research

Community Co-development

Interoperable Ecosystem

Production Grade

Flexibility for fast ideation and breakthrough

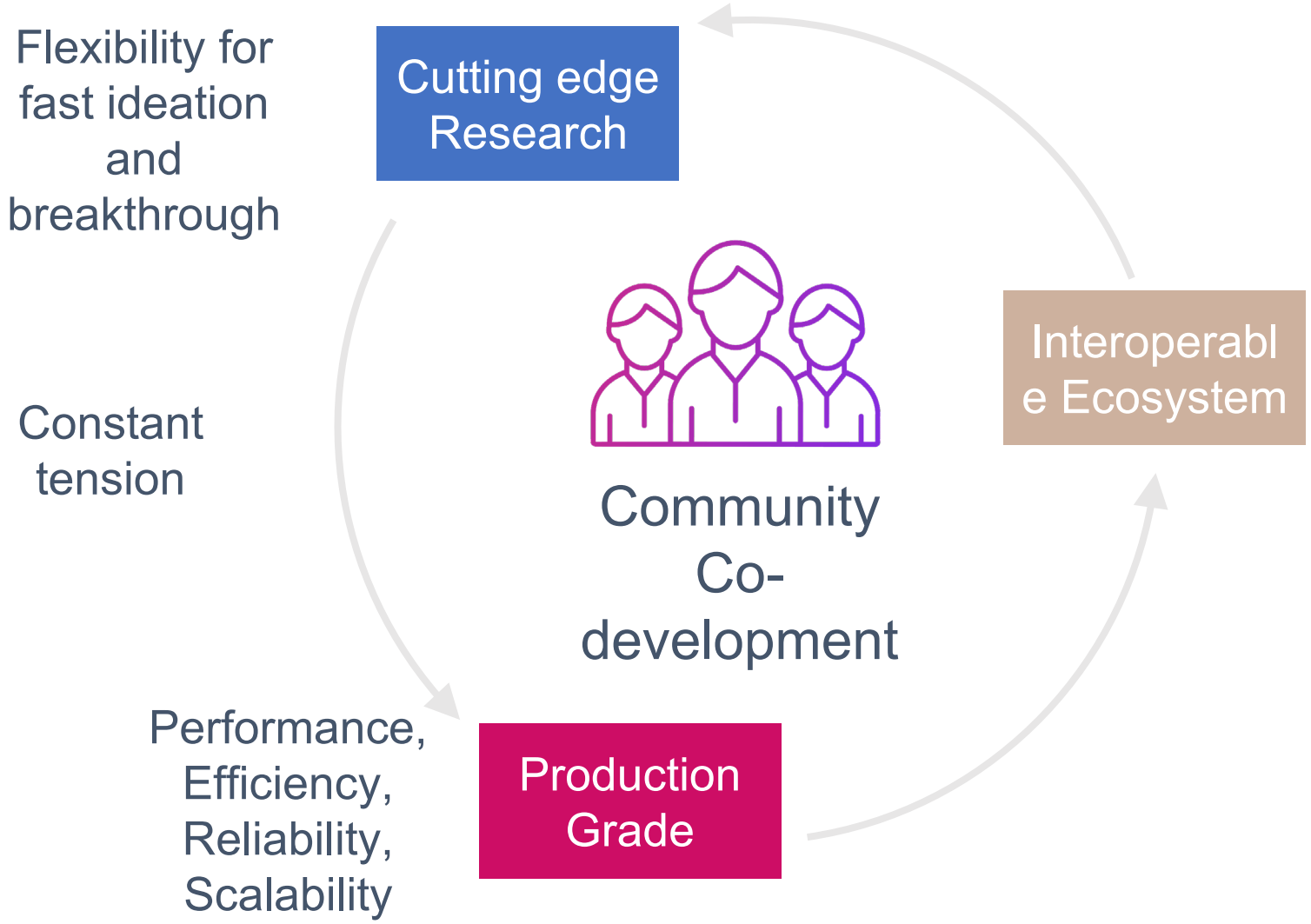
Cutting edge Research

Interoperabl e Ecosystem

Community Co-development

Performance, Efficiency, Reliability, Scalability

Production Grade


Flexibility for fast ideation and breakthrough
Cutting edge Research
Constant tension
Community Co-development
Interoperabl e Ecosystem
Performance, Efficiency, Reliability, Scalability
Production Grade

Constant tension

Cutting edge Research

Community Co-development

Interoperabl e Ecosystem

Production Grade

Constant tension

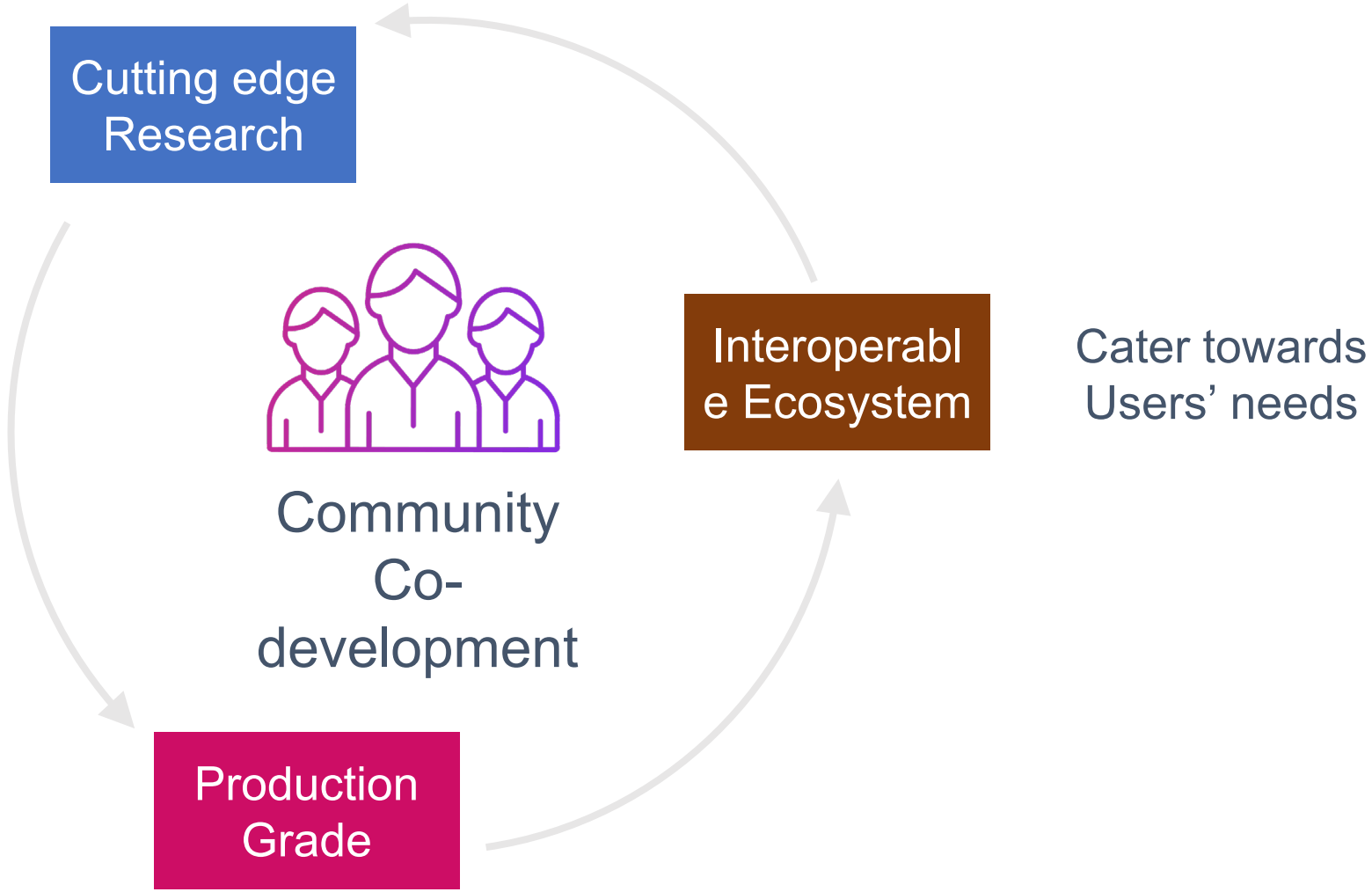
Cutting edge Research

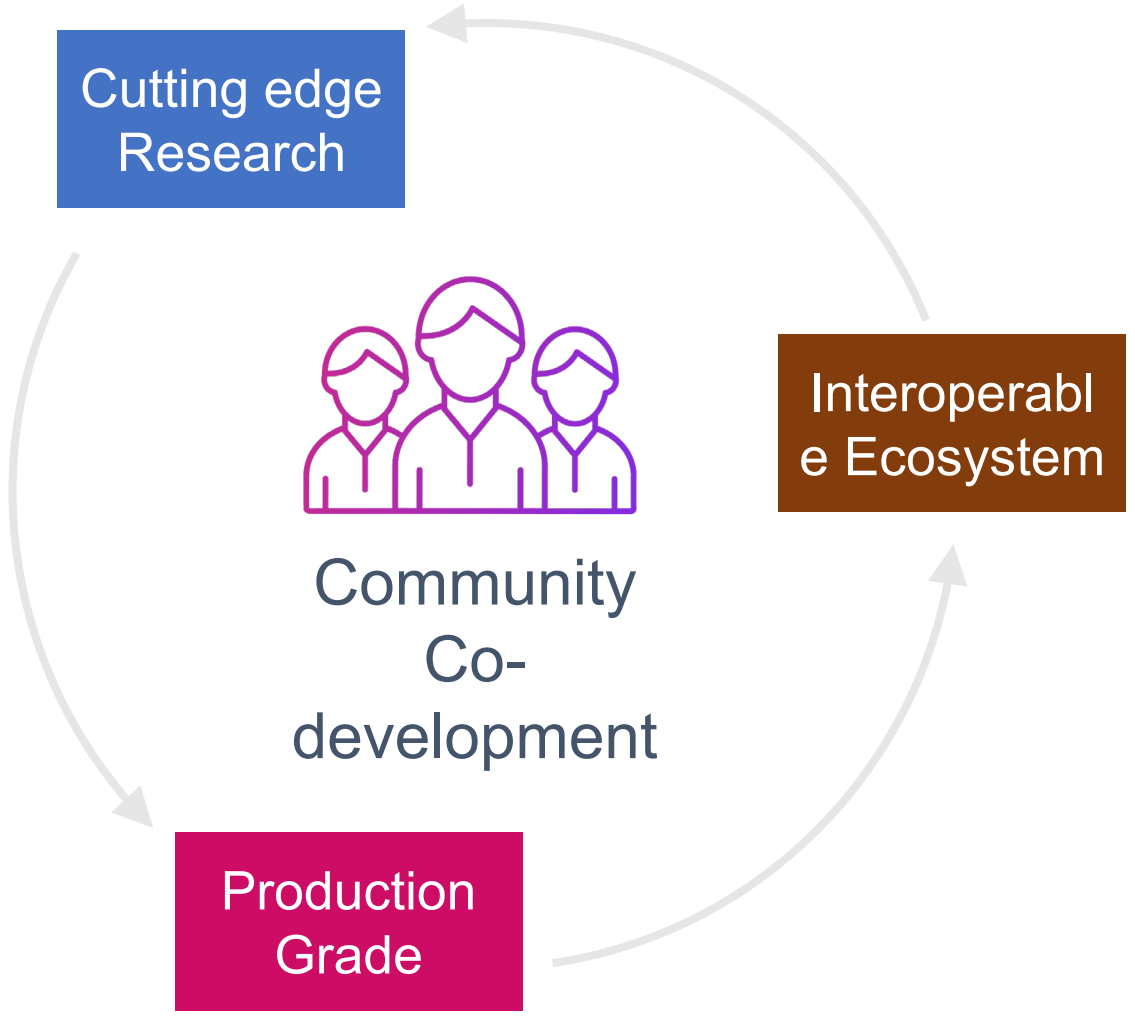
Community Co-development

Wide workload helps strike a good balance in the tradeoff

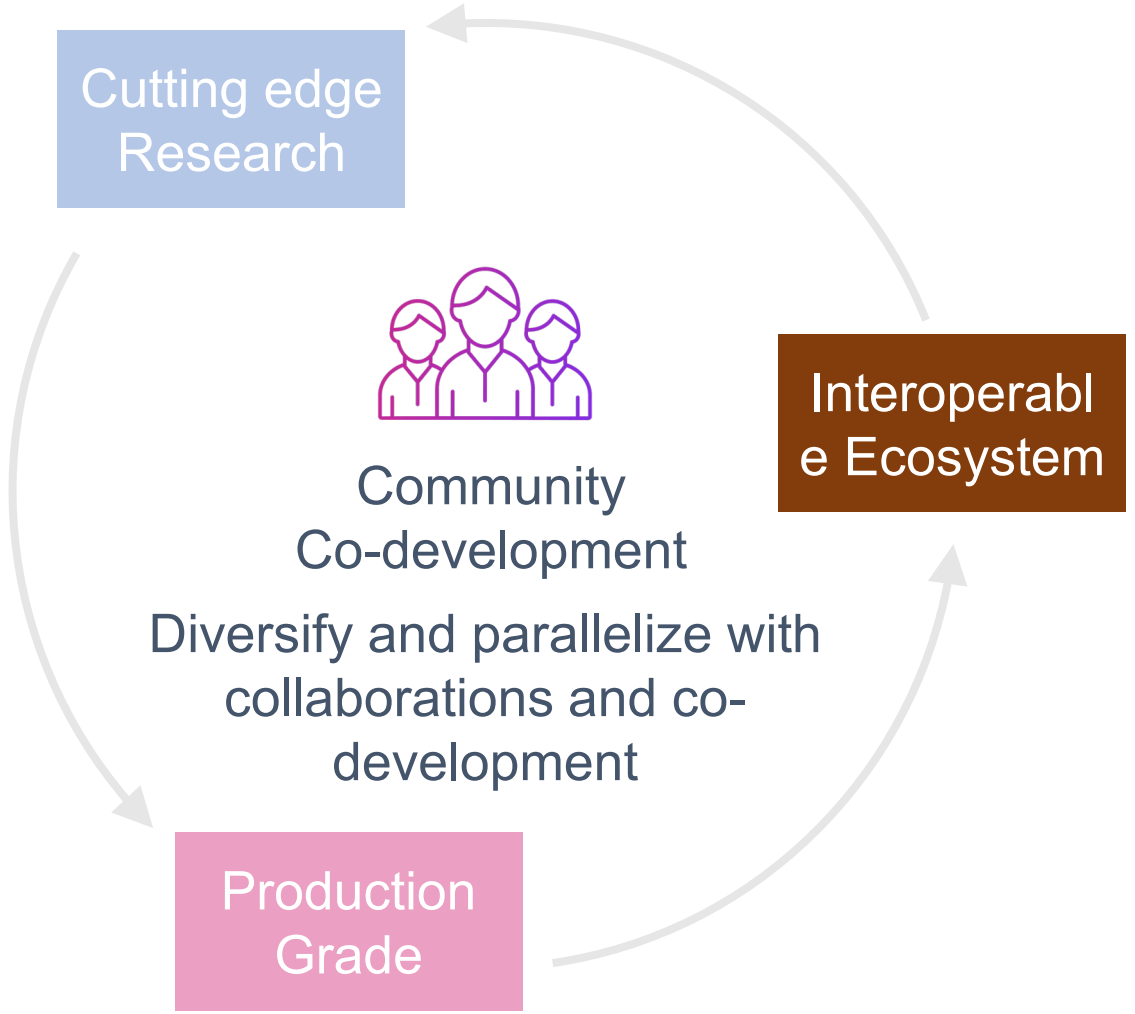
Interoperable Ecosystem

Production Grade


Cutting edge Research
Community Co-development
Interoperable Ecosystem
Production Grade
Cater towards Users' needs



We can’t enable everything ourselves



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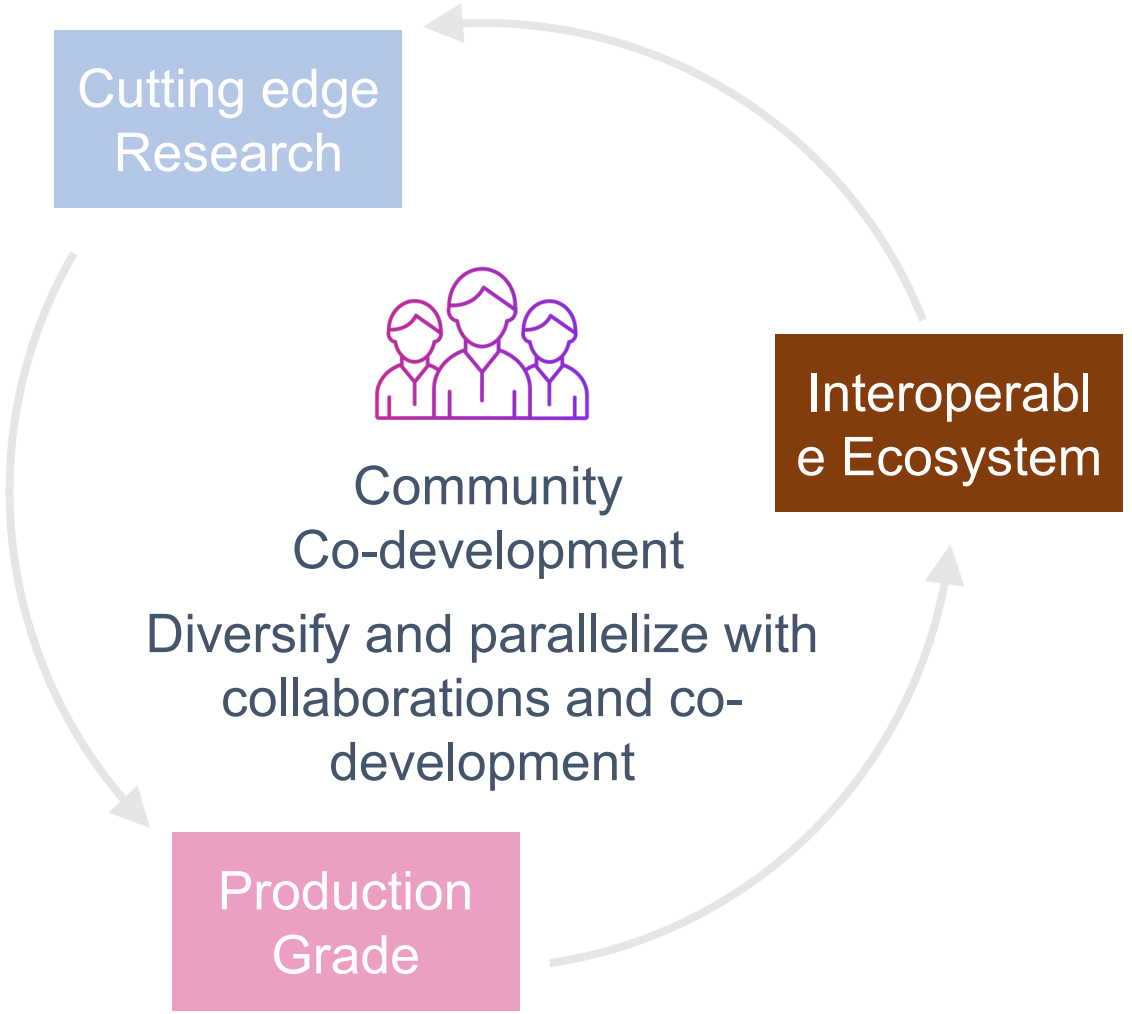

fast.ai

MONAI

kornia

OpenMined

PyTorch geometric

Cutting edge Research

Community
Co-development

Diversify and parallelize with collaborations and co-development

Interoperabl e Ecosystem

Production Grade

THANK YOU