

# Case Study

Automotive  
Workload Optimization



## Mobileye Achieves 45% More Performance, 44.5% Less Cost with Granulate™ An Intel Company<sup>1</sup>

**Groundbreaking autonomous workload optimization yields value in days, leading to faster development**



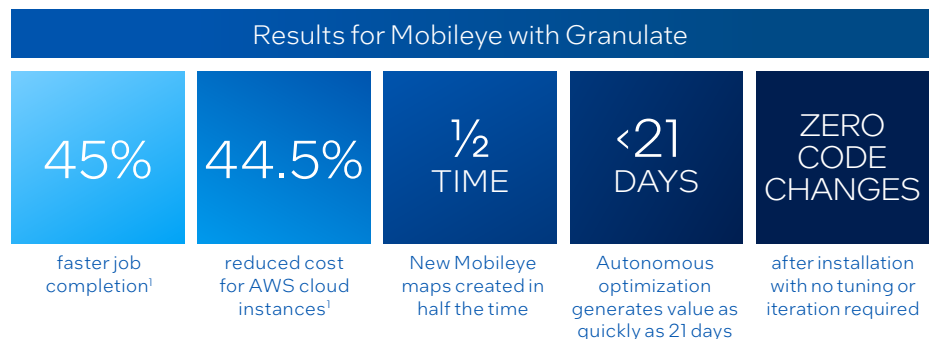
Mobileye™ an Intel company and market leader in advanced driver-assistance systems (ADASs) and autonomous vehicles (AVs), relies on cloud optimization to build its new mapping system, cameras, and other AI tools and applications. More than 70 million vehicles worldwide, from companies including BMW, Volkswagen, Ford, and Nissan, use Mobileye for driver assistance. Mobileye's Road Experience Management™ (REM™) system creates and perpetually updates maps to ensure that drivers and autonomous vehicles have the information they need to travel safely and efficiently.

*"Because our new code gets seamlessly accelerated every day, we can develop more quickly, and this means our time to market is much faster. To create a country map using Granulate, it's now taking us half the time at half the cost."*

—Tal Babaioff, vice president of Mapping and Localization and cogeneral manager of REM at Mobileye, an Intel company

### Mobileye realizes business value fast

Mobileye implemented Granulate software in their hybrid cloud environment, yielding tremendous gains in performance and cost efficiency and faster development cycles for new updates and product releases. Granulate is an autonomous optimization software solution that loads into an existing data center or cloud environment and optimizes resource management without human intervention. Using this tool, Mobileye was able to realize value in a matter of days, with zero code changes on their end.



### Mapping the world is compute intensive

Mobileye's innovative technologies make huge demands on their hybrid cloud infrastructure. The REM system is compute intensive and requires continuous development to create accurate maps at scale while continually updating a database that maps over 625 million miles. Long development and testing cycles were reducing developer productivity and making it difficult for the REM team to transition from research and development into production. When adding new applications, algorithms, and features, the REM team was forced to compromise between the speed of development and the optimization of code.



Figure 1. Mobileye Roadbook in an autonomous vehicle.

*“Granulate provides a significant performance boost on Intel® Xeon® Scalable processors, without any code modifications, in less than 21 days. We’ve seen more and more customers add the optimizer with our latest-generation processors across all types of clouds.”*

— Kevin Johnson, general manager, Cloud and Enterprise Solutions and Technology Sales Group at Intel

*“Companies of all sizes are facing an increased demand for computing resources. Granulate helps maximize the use of computing resources while improving performance and reducing cost.”*

— Asaf Ezra, cofounder and CEO of Granulate™ an Intel Company

### Transformative value with Granulate

Workload optimization is often costly, disruptive, and time consuming. Most optimization efforts require users to rewrite their code to achieve performance improvements, resulting in time away from a business’s core product development. Mobileye was interested in the potential of autonomous optimization and wanted to see if Granulate could deliver worthwhile performance gains without consuming valuable development resources. “We did a benchmark on one of Mobileye’s workloads because they wanted to see the Granulate results for their specific application,” explains Asaf Ezra, cofounder and CEO of Granulate. Within two weeks, Granulate showed Mobileye the benchmarks of their code optimization. “We were basically blown away,” says Pini Reisman, director, REM Cloud Application at Mobileye. Once Mobileye adopted Granulate, the REM team was impressed with the many benefits that the optimizer provided, beyond the remarkable performance increases and cost savings at AWS.

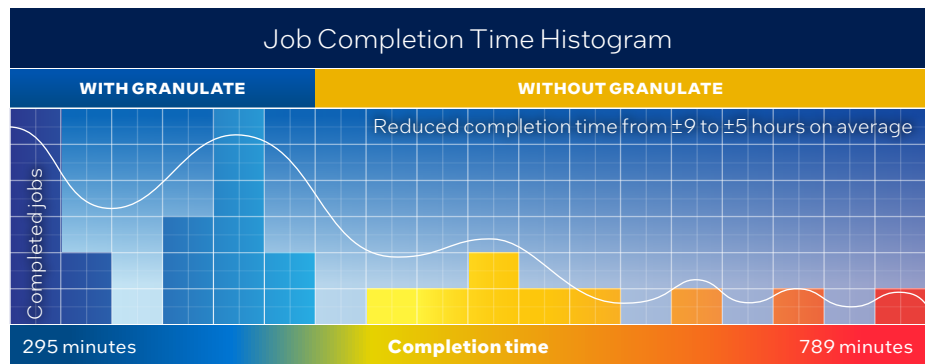


Figure 2. Granulate reduced Mobileye workload completion time by 44.5 percent.<sup>1</sup>

### Intel® Ignite ecosystem leads to Granulate-Mobileye partnership

Granulate is an inaugural member of Intel Ignite, a start-up accelerator formed by Intel to create and support select groups of promising early-stage companies. Intel introduced Mobileye to Granulate and asked Mobileye to benchmark the solution with their key workloads on Intel® Xeon® Scalable processor-enabled architecture. The results (see Figure 2) prompted Mobileye to significantly expand the deployment of the workload optimization solution to additional workloads.

*“Installing the Granulate solution was frictionless and seamless, not only because we didn’t need to do anything to achieve the gains but also because Granulate invested a lot in making the integration very easy and straightforward”*

—Pini Reisman, director of REM Cloud Application at Mobileye

### Real-time continuous optimization

Once installed, Granulate agents learn the resource usage patterns and the dataflow of the application and operating system. The agents use US-patented algorithmic models to identify instances of data bottlenecks and resource contention within workloads and then adjust resource management decisions that accelerate dataflow through an application. This process involves adapting resource

allocation at the operating system and runtime level to continuously and autonomously optimize memory allocation, process swapping, thread scheduling, storage access, and network communications. Users perpetually experience performance increases as Granulate continuously recognizes usage patterns and optimizes each workload.

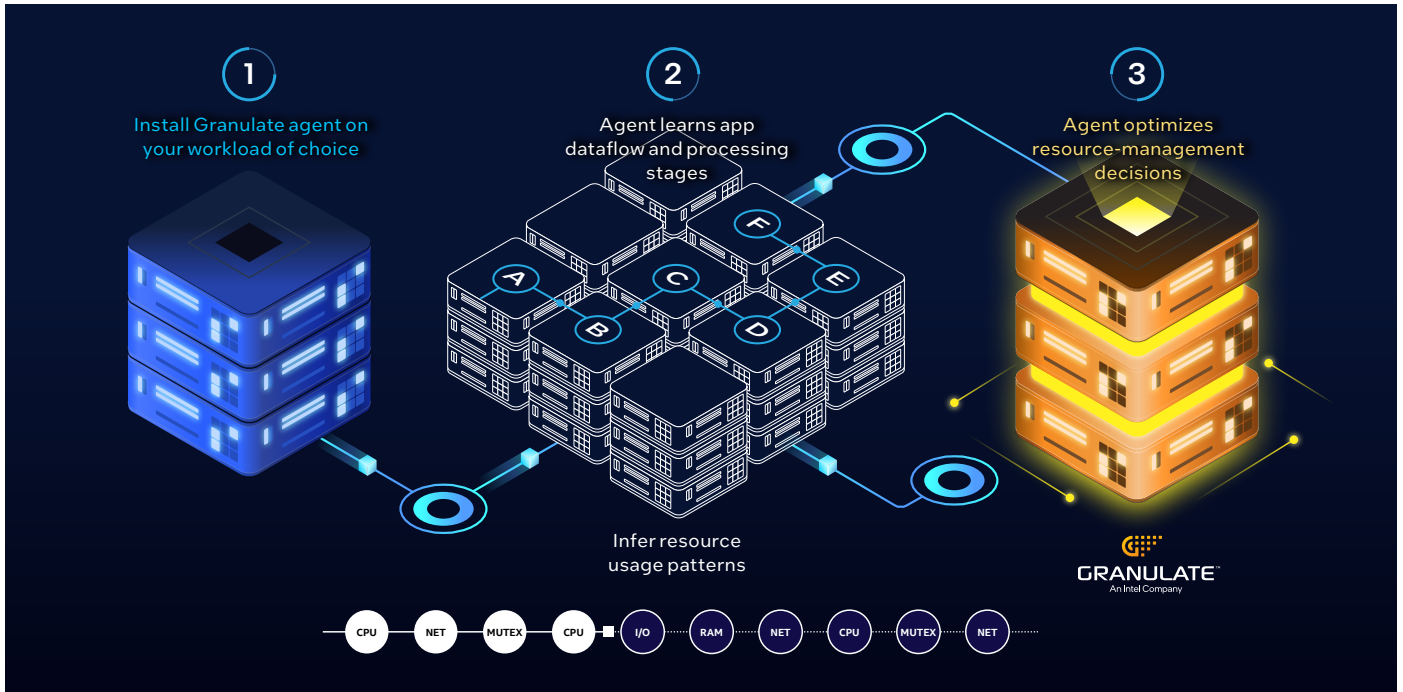







Figure 3. Granulate automatically identifies and resolves bottlenecks and resource contention within application dataflow.

### Granulate key benefits

				
<p><b>Time savings from seamless integration</b> Granulate works with any cloud or on-premises environment and with containers or orchestrators like Kubernetes. Once deployed, the optimizer does not require any additional maintenance.</p>	<p><b>Continuous value from optimization</b> After installation, Granulate will continuously identify new resource usage patterns as businesses make changes or updates to their workflows, resulting in ongoing performance improvements even as the applications change.</p>	<p><b>Greater agility for DevOps</b> By freeing up resources that a DevOps team would otherwise spend on performance tuning and iterations, Granulate allows teams to focus on core product research and development.</p>	<p><b>Accelerated time to market</b> Faster workload performance with fewer data bottlenecks and less resource contention allows businesses to develop new services and updates faster, shortening time to market and time to value.</p>	<p><b>Greater infrastructure stability</b> Higher performance with fewer data bottlenecks allows businesses to achieve more reliable uptime for their services, making it easier to meet service level agreements (SLAs).</p>



Granulate Proof-of-Concept Benchmarks:

UP TO

Big data	45% <sup>1</sup>
Java, Scala, Clojure, and Kotlin applications	52% <sup>3</sup>
Go, Python, and Ruby applications	60% <sup>4</sup>
Node.js applications	28% <sup>5</sup>
Kafka and stream processing	35% <sup>6</sup>

COST REDUCTION

**Granulate enables customers to focus on their core business**

As the valuation of the global cloud computing market is expected to exceed USD 1 trillion by 2026,<sup>2</sup> more and more businesses will rely on the cloud for developing and delivering new products and offerings, and the need to optimize will also escalate. Granulate is already helping businesses extend the capabilities of their cloud infrastructure and lower costs with minimal effort, freeing up DevOps resources to focus on new and exciting innovations. The best way to get started is to ask for a proof-of-concept estimate, which is a quick and easy way to see the potential savings and performance improvement Granulate can help achieve for your specific workloads.

**Get a quick-turnaround estimate**

Contact your Intel representative to ask about profiling your workloads on Granulate.

[Learn more about Granulate >](#)

[Learn more about Mobileye REM >](#)

[Learn more about cloud optimization tools from Intel >](#)

[Learn more about Intel Ignite >](#)



1. Internal measurements provided by Mobileye and Granulate and tested on AWS EC2 instances R4.8xlarge, R4.16xlarge, R5.8xlarge, R5.16xlarge, R5.24xlarge. For more information on configurations, see [aws.amazon.com/ec2/instance-types/](https://aws.amazon.com/ec2/instance-types/).
2. Globe Newswire. April 2021. "USD 1025.9 Billion Expected for Cloud Computing Market Size & Share at 18% CAGR by 2026: FnF Research." See [globenewswire.com/news-release/2021/04/07/2206013/0/en/USD-1025-9-Billion-Expected-for-Cloud-Computing-Market-Size-Share-at-18-CAGR-by-2026-FnF-Research.html](https://globenewswire.com/news-release/2021/04/07/2206013/0/en/USD-1025-9-Billion-Expected-for-Cloud-Computing-Market-Size-Share-at-18-CAGR-by-2026-FnF-Research.html)
3. Granulate on YouTube. April 2021. "Granulate - Perion Success Story." See [youtube.com/watch?v=6a2pkOKzo-s](https://youtube.com/watch?v=6a2pkOKzo-s)
4. Granulate. 2021. "Bigabid uses Granulate to dramatically reduce bid timeouts, latency, and compute costs." See [granulate.io/case-studies/bigabid/](https://granulate.io/case-studies/bigabid/)
5. Granulate on YouTube. April 2021. "Granulate - PicsArt Success Story." See [youtube.com/watch?v=elopqZITb4w](https://youtube.com/watch?v=elopqZITb4w)
6. Granulate. 2021. "How AppsFlyer cut compute costs by 30% with no code changes." See [granulate.io/case-studies/appsflyer/](https://granulate.io/case-studies/appsflyer/)

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