7 Theoretical Analysis

Theorem 7.1. *Suppose*

$$H(\mathcal{O}, \cup_{t=1}^{T} \mathcal{Z}_t) \leq \varepsilon_o, \tag{11}$$

and

$$H(S_t, \mathcal{Z}_t) \leq \varepsilon_t, \quad H(\mathcal{M}_t, S_t \cup \mathcal{M}_{t-1}) \leq \widehat{\varepsilon}_t \tag{12}$$

for all $t = 1, \ldots, T$ *with* $S_1 = \mathcal{M}_1$, $\mathcal{M}_0 = \emptyset$, *and* $\widehat{\varepsilon}_0 = 0$, *where* $\mathcal{O} = \mathcal{G}_{n_0}(\cup_{t=1}^{T} \mathcal{Z}_t)$, $S_t = \mathcal{G}_{n_t}(\mathcal{Z}_t; \mathcal{M}_{t-1})$, *and* $\mathcal{M}_t = \mathcal{G}_{m_t}(S_t \cup \mathcal{M}_{t-1})$. *Then, we have*

$$H(\mathcal{O}, \mathcal{M}_T) \leq \varepsilon_o + \max_{1 \leq k \leq T} \left(\varepsilon_k + \sum_{j=k}^{T} \widehat{\varepsilon}_j \right) \tag{13}$$

for sufficiently large $n_o \leq |\cup_{t=1}^{T} \mathcal{Z}_t|$, $n_t \leq |\mathcal{Z}_t|$, *and* $m_t \leq |S_t \cup \mathcal{M}_{t-1}|$

We prove the above main theorem step-by-step as follows:

7.1 Definitions

The greedy sampling operation on a set $\mathcal{Z}$ of embeddings and on a base set B is defined as follows:

$$\mathcal{G}_n(\mathcal{Z}; B) = \{z_i \in \mathcal{Z} : z_i = \underset{z \in \mathcal{Z} \setminus \{z_1, \ldots, z_{i-1}\}}{\arg\max} \; d(z, \{z_1, \ldots, z_{i-1}\} \cup B)\} \tag{14}$$

for $2 \leq i \leq n$. The initial point z_1 is given as $z_1 = \arg\max_{z \in \mathcal{Z}} d(z, B)$. We denote $\mathcal{G}(\mathcal{Z}) = \mathcal{G}(\mathcal{Z}; \emptyset)$.

Define

$$d(\mathcal{Z}_1, \mathcal{Z}_2) = \min_{z_1 \in \mathcal{Z}_1} \min_{z_2 \in \mathcal{Z}_2} d(z_1, z_2), \tag{15}$$

Then Hausdorff distance H is defined by

$$H(S_1, S_2) = \max(\max_{z_1 \in S_1} d(z_1, S_2), \max_{z_2 \in S_2} d(z_2, S_1)). \tag{16}$$

7.2 Derivations

We first state Triangle Inequality and Subadditivity of Hausdorff distance [6, 10, 12], which we will freely use throughout the derivations:

Proposition 7.2 (Triangle Inequality). *Let A, B, and C be subsets of the same metric space with metric d. Then,*

$$H(A, C) \leq H(A, B) + H(B, C). \tag{17}$$

Proposition 7.3 (Subadditivity).

$$H(A \cup B, C) \leq \max\left(H(A, C), H(B, C)\right) \tag{18}$$

Note that the subadditivity trivially implicates

$$H(A \cup B, C \cup D) \leq \max\left(H(A, C), H(B, D)\right) \tag{19}$$

as $C \subseteq C \cup D$ and same for D.

Theorem 7.4. *Suppose* $H(\mathcal{O}, \cup_{t=1}^{T} \mathcal{Z}_t) \leq \varepsilon_o$, *and for all* $t = 1, \ldots, T$ *we have* $H(S_t, \mathcal{Z}_t) \leq \varepsilon_t$ *with* $S_1 = \mathcal{M}_1$. *Suppose* $H(\mathcal{M}_t, S_t \cup \mathcal{M}_{t-1}) \leq \widehat{\varepsilon}_t$ *for* $t = 1, \ldots, T$ *with* $\mathcal{M}_0 = \emptyset$ *and* $\widehat{\varepsilon}_0 = 0$. *Then, we have*

$$H(\mathcal{O}, \mathcal{M}_T) \leq \varepsilon_o + \delta_T \tag{20}$$

where

$$\delta_t = \widehat{\varepsilon}_t + \max(\varepsilon_t, \delta_{t-1}) \tag{21}$$

for $t = 1, \ldots, T$ *with* $\delta_0 = 0$

Proof. We will prove by induction that

$$H\Big(\bigcup_{k=1}^{t} \mathcal{Z}_k,\, \mathcal{M}_t\Big) \;\leq\; \delta_t \quad \text{for each}$$

for each $t = 1, \ldots, T$ where

$$\delta_t \;=\; \widehat{\varepsilon}_t \;+\; \max\big(\varepsilon_t,\, \delta_{t-1}\big), \qquad \delta_0 = 0.$$

Once this is established for $t = T$, we can then combine it with

$$H\Big(\mathcal{O},\, \bigcup_{k=1}^{T} \mathcal{Z}_k\Big) \;\leq\; \varepsilon_o$$

to conclude the desired by the triangle inequality.

Base Case $t = 1$. Recall $S_1 = \mathcal{M}_1$. Then

$$H(\mathcal{Z}_1, \mathcal{M}_1) \;\leq\; H(\mathcal{Z}_1, S_1) \;+\; H(S_1, \mathcal{M}_1) \;=\; \varepsilon_1 \;+\; \widehat{\varepsilon}_1 \;=\; \delta_1.$$

So the claim holds for $t = 1$.

Inductive Step. Suppose for some $t - 1 \geq 1$ we have

$$H\Big(\bigcup_{k=1}^{t-1} \mathcal{Z}_k,\, \mathcal{M}_{t-1}\Big) \;\leq\; \delta_{t-1}.$$

By the triangle inequality and the assumption $H(\mathcal{M}_{t-1} \cup S_t, \mathcal{M}_t) \leq \widehat{\varepsilon}_t$,

$$H\Big(\bigcup_{k=1}^{t} \mathcal{Z}_k,\, \mathcal{M}_t\Big) \;\leq\; H\Big(\bigcup_{k=1}^{t-1} \mathcal{Z}_k \cup \mathcal{Z}_t,\, \mathcal{M}_{t-1} \cup S_t\Big) \;+\; \widehat{\varepsilon}_t,$$

where

$$H\Big(\bigcup_{k=1}^{t-1} \mathcal{Z}_k \cup \mathcal{Z}_t,\, \mathcal{M}_{t-1} \cup S_t\Big) \;\leq\; \max\Big\{H\big(\bigcup_{k=1}^{t-1} \mathcal{Z}_k,\, \mathcal{M}_{t-1}\big),\, H(\mathcal{Z}_t, S_t)\Big\} \;\leq\; \max(\delta_{t-1}, \varepsilon_t)$$

Putting it all together:

$$H\Big(\bigcup_{k=1}^{t} \mathcal{Z}_k,\, \mathcal{M}_t\Big) \;\leq\; \max(\delta_{t-1},\, \varepsilon_t) \;+\; \widehat{\varepsilon}_t \;=\; \delta_t.$$

$\square$

Proposition 7.5. *Consider the inductive sequence*

$$\delta_0 = 0 \quad \textit{and} \quad \delta_t = \widehat{\varepsilon}_t + \max\big(\varepsilon_t,\, \delta_{t-1}\big) \quad \textit{for} \quad t \geq 1.$$

A direct "unrolling" of this recursion reveals the closed-form expression

$$\delta_t = \max_{1\leq k\leq t}\left(\varepsilon_k + \sum_{j=k}^{t}\widehat{\varepsilon}_j\right). \tag{22}$$

Proof. First check $t = 1$. In that case,

$$\delta_1 = \widehat{\varepsilon}_1 + \max(\varepsilon_1,\, \delta_0) = \widehat{\varepsilon}_1 + \varepsilon_1 = \varepsilon_1 + \sum_{j=1}^{1}\widehat{\varepsilon}_j = \max_{1\leq k\leq 1}\big(\varepsilon_k + \widehat{\varepsilon}_k\big).$$

Assume for some $t \geq 1$ that

$$\delta_{t-1} = \max_{1\leq k\leq t-1}\left(\varepsilon_k + \sum_{j=k}^{t-1}\widehat{\varepsilon}_j\right).$$

Then

$$\delta_t = \widehat{\varepsilon}_t + \max\big(\varepsilon_t,\, \delta_{t-1}\big) = \max\Big(\varepsilon_t + \widehat{\varepsilon}_t,\, \delta_{t-1} + \widehat{\varepsilon}_t\Big).$$

Inserting the inductive hypothesis into the second term,

$$\delta_{t-1} + \widehat{\varepsilon}_t = \max_{1\leq k\leq t-1}\left(\varepsilon_k + \sum_{j=k}^{t-1}\widehat{\varepsilon}_j\right) + \widehat{\varepsilon}_t = \max_{1\leq k\leq t-1}\left(\varepsilon_k + \sum_{j=k}^{t}\widehat{\varepsilon}_j\right).$$

Hence

$$\delta_t = \max\left(\varepsilon_t + \widehat{\varepsilon}_t,\, \max_{1\leq k\leq t-1}\big(\varepsilon_k + \sum_{j=k}^{t}\widehat{\varepsilon}_j\big)\right) = \max_{1\leq k\leq t}\left(\varepsilon_k + \sum_{j=k}^{t}\widehat{\varepsilon}_j\right).$$

This completes the inductive argument and establishes (22). ☐

Proof of Theorem 7.1. By Theorem 7.4,

$$H(\mathcal{O},\, \mathcal{M}_T) \leq \varepsilon_o + \delta_T \tag{23}$$

where

$$\delta_t = \widehat{\varepsilon}_t + \max(\varepsilon_t, \delta_{t-1}) \tag{24}$$

for $t = 1, \ldots, T$ with $\delta_0 = 0$. Therefore, by Proposition 7.5, we complete the proof. ☐

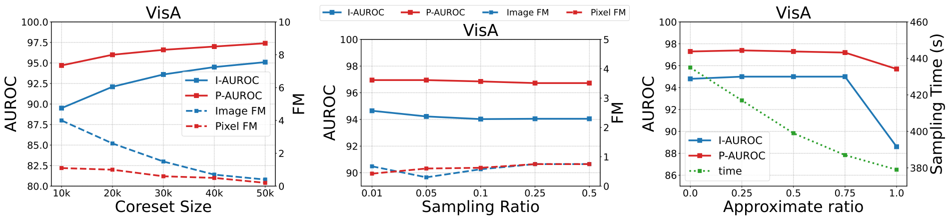
Table 11: The results of MVTecAD dataset on few step incremental schedules where we report task mean average precision (AP) (↑) and forgetting measurement (FM) (↓). The best and second best results are marked in **bold** and <u>underlined</u>, respectively.

Method	1 × 15 with 15 Steps		3 × 5 with 5 Steps		10 – 1 × 5 with 6 Steps		10 – 5 with 2 Steps		14 – 1 with 2 Steps	
	AP (↑)	FM (↓)	AP (↑)	FM (↓)	AP (↑)	FM (↓)	AP (↑)	FM (↓)	AP (↑)	FM (↓)
DNE $_{\text{ACMMM'22}}$ [ ]	75.9	10.2	76.4	4.4	71.4	9.8	77.0	2.6	76.0	1.9
UCAD $_{\text{AAAI'24}}$ [ ]	<u>95.3</u>	**0.0**	93.1	2.0	95.5	<u>0.1</u>	95.0	1.0	95.8	0.3
IUF $_{\text{ECCV'24}}$ [ ]	84.1	2.0	91.1	2.9	95.3	0.2	95.4	1.9	97.8	0.3
CDAD $_{\text{CVPR'25}}$ [ ]	86.3	8.2	<u>95.8</u>	<u>1.9</u>	<u>98.4</u>	**0.0**	<u>98.3</u>	<u>0.6</u>	<u>98.4</u>	<u>0.1</u>
ContCore (**ours**)	**99.3**	<u>0.3</u>	**99.3**	**0.2**	**99.7**	**0.0**	**99.5**	**0.1**	**99.4**	**0.0**

Table 12: The results of MVTecAD dataset on few step incremental schedules where we report task average PRO (↑) and forgetting measurement (FM) (↓). The best and second best results are marked in **bold** and <u>underlined</u>, respectively.

Method	1 × 15 with 15 Steps		3 × 5 with 5 Steps		10 – 1 × 5 with 6 Steps		10 – 5 with 2 Steps		14 – 1 with 2 Steps	
	AUPRO (↑)	FM (↓)	AUPRO (↑)	FM (↓)	AUPRO (↑)	FM (↓)	AUPRO (↑)	FM (↓)	AUPRO (↑)	FM (↓)
UCAD $_{\text{AAAI'24}}$ [ ]	<u>87.6</u>	**-0.8**	71.1	7.5	80.8	<u>1.2</u>	80.7	2.9	86.3	1.2
IUF $_{\text{ECCV'24}}$ [ ]	78.7	6.8	72.9	5.8	84.3	2.4	85.0	3.2	88.6	0.6
CDAD $_{\text{CVPR'25}}$ [ ]	68.5	22.1	<u>83.8</u>	<u>4.1</u>	<u>89.2</u>	<u>1.2</u>	<u>88.9</u>	<u>2.6</u>	<u>89.8</u>	<u>0.5</u>
ContCore (**ours**)	**99.3**	<u>0.3</u>	**96.3**	**0.2**	**99.7**	**0.0**	**96.0**	**0.2**	**96.5**	**0.0**

8 Additional results



(a) (b) (c)

Figure 5: Ablation results of ContCore on VisA by varying coreset size m (left), sampling ratio p (middle), approximation ratio q (right).

Additional quantitative results We compare ContCore with the SOTA baselines in terms of task mean image-level Average Precision (AP) and pixel-level Area Under the Per-Region-Overlap (AUPRO). We report the AP and AUPRO on the MVTecAD dataset in Tab. 11 and Tab. 12, respectively. We also report the AP and AUPRO on the VisA dataset in Tab. 13 and Tab. 14, respectively. All the aforesaid tables show that ContCore outperform the SOTA baselines in most cases.

Additional ablation results We condcut additional ablation experiments with VisA dataset with results in Fig. 5 which shows similar aspects as the ablation study on MVTecAD dataset: larger coreset size showing better rsults, sampling ratio doesn't show critical effect, and moderately high approximate ratio saves time with negligible performance drop.

Comparing with different sampling methods We compare our proposed sampling with Reservoir and Herding. Reservoir sampling is uniform (density, not coverage) and Herding matches the mean and needs class labels, absent in unsupervised CAD, so we adapt it with task means. Loss-based coreset selection is undefined without a training loss. Our contribution is making this coverage objective continuable under fixed memory and unknown T, with

Table 13: The results of VisA dataset on few step incremental schedules where we report task mean average precision (AP) (↑) and forgetting measurement (FM) (↓). The best and second best results are marked in **bold** and <u>underlined</u>, respectively.

Method	**1 × 12 with 12 Steps**		**8 – 1 × 4 with 5 Stepss**		**8 – 4 with 2 Steps**		**11 – 1 with 2 Steps**	
	AP (↑)	**FM (↓)**	**AP (↑)**	**FM (↓)**	**AP (↑)**	**FM (↓)**	**AP (↑)**	**FM (↓)**
DNE $_{\text{ACMMM'22}}$ [18]	65.1	11.6	66.1	**1.3**	67.3	9.8	70.8	1.6
UCAD $_{\text{AAAI'24}}$ [20]	81.7	**0.0**	82.9	2.2	83.2	5.2	88.1	0.3
IUF $_{\text{ECCV'24}}$ [27]	<u>88.8</u>	1.2	83.0	6.9	83.4	7.5	<u>91.6</u>	<u>-0.0</u>
CDAD $_{\text{CVPR'25}}$ [19]	67.6	14.0	<u>84.7</u>	<u>1.8</u>	<u>85.3</u>	<u>3.1</u>	89.4	**-0.8**
ContCore (**ours**)	**96.5**	<u>0.1</u>	**94.1**	<u>1.8</u>	**96.7**	**0.4**	**94.8**	0.6

Table 14: The results of VisA dataset on few step incremental schedules where we report task average PRO (↑) and forgetting measurement (FM) (↓). The best and second best results are marked in **bold** and <u>underlined</u>, respectively.

Method	**1 × 12 with 12 Steps**		**8 – 1 × 4 with 5 Stepss**		**8 – 4 with 2 Steps**		**11 – 1 with 2 Steps**	
	AUPRO (↑)	**FM (↓)**	**AUPRO (↑)**	**FM (↓)**	**AUPRO (↑)**	**FM (↓)**	**AUPRO (↑)**	**FM (↓)**
UCAD $_{\text{AAAI'24}}$ [20]	80.0	<u>0.5</u>	70.5	9.8	72.4	7.5	80.4	2.0
IUF $_{\text{ECCV'24}}$ [27]	<u>83.3</u>	4.7	57.0	24.0	63.9	20.8	<u>82.0</u>	1.0
CDAD $_{\text{CVPR'25}}$ [19]	59.0	17.0	<u>77.7</u>	**1.7**	<u>78.9</u>	<u>1.6</u>	81.6	**-0.2**
ContCore (**ours**)	**96.5**	**0.1**	**94.1**	<u>1.8</u>	**96.7**	**0.4**	**94.8**	<u>0.6</u>

the additive-error guarantee of Theorem. 4.1. The continuation is non-trivial beyond naive repeated greedy downsampling. Expansion conditions on the current coreset via the base set, so only n_t coverage-adding features enter memory before consolidation, the two-step structure Theorem 4.1 analyzes. We ran the requested fixed-memory baselines with identical budget (m=20k), features, and inference shown in Tab. 25, averaged over all schedules.

Qualitative results We compare the quality of pixel-wise anomaly detection of the SOTA baselines with ContCore in Fig. 6, IUF [27] and CDAD [19] show poor results presenting false positive segmentation in normal areas. UCAD [20] shows less than IUF and CDAD, yet still produces false positives. As shown in the samples from schedules 10 – 5 (Fig. 7), 10 – 1×5 (Fig. 8), and 14 – 1 (Fig. 9), UCAD shows poor anomaly pixel detection with tasks with multiple classes, while IUF and CDAD show poor results when the number of additional tasks increases for multiple steps as shown in Fig. 6, Fig. 8, and Fig. 10, suffering from catastrophic forgetting. Our propose method ContCore, on the other hand, shows the least false positives and predicts the anomaly maps closest to the ground truth comparing with the SOTA baselines.

Table 15: Full restuls of ablation on different backbones on MVTecAD dataset.

Backbone	1 × 15 with 15 Steps		3 × 5 with 5 Steps		10 – 1 × 5 with 6 Steps		10 – 5 with 2 Steps		14 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
DenseNet201	98.1 / 96.8	0.8 / 0.3	95.7 / 95.1	1.7 / 1.0	98.4 / 95.7	0.5 / 0.2	95.5 / 93.3	1.2 / 0.6	97.0 / 96.1	0.0 / 0.0
DINOv2	97.6 / 94.3	0.0 / 0.0	97.4 / 93.9	-0.0 / 0.0	98.5 / 92.3	0.0 / 0.0	97.6 / 92.8	0.0 / 0.0	98.2 / 92.4	0.0 / 0.0
EfficientNet b1	95.2 / 95.0	0.0 / 0.0	95.5 / 94.2	0.0 / -0.0	96.7 / 94.2	0.0 / 0.0	96.1 / 94.0	0.0 / -0.0	96.6 / 94.8	0.0 / 0.0
WideResNet101	99.0 / 97.8	0.1 / 0.1	97.2 / 96.7	0.9 / 0.6	99.0 / 96.9	0.3 / 0.2	98.4 / 96.8	0.7 / 0.6	98.8 / 97.6	0.1 / 0.0

Table 16: Full restuls of ablation on different backbones on VisA dataset.

Backbone	1 × 12 with 12 Steps		8 – 1 × 4 with 5 Stepss		8 – 4 with 2 Steps		11 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
DenseNet201	91.8 / 96.9	2.4 / 0.5	94.4 / 96.6	2.2 / 0.4	91.0 / 95.2	3.0 / 0.6	93.6 / 96.9	1.1 / 0.2
DINOv2	92.8 / 95.0	0.0 / 0.0	94.2 / 94.3	0.1 / 0.0	93.3 / 94.5	-0.0 / -0.0	94.3 / 96.5	0.0 / -0.0
EfficientNet b1	88.3 / 95.3	0.0 / 0.0	91.0 / 96.1	0.0 / 0.0	88.2 / 95.3	0.2 / -0.0	90.8 / 96.3	0.0 / -0.0
WideResNet101	93.8 / 97.4	1.5 / 0.5	96.5 / 97.4	0.8 / 0.4	92.7 / 96.8	2.4 / 1.1	94.6 / 97.4	-0.0 / 0.0

Table 17: Full results of ablation on corset size m on MVTecAD dataset.

Coreset Size m	1 × 15 with 15 Steps		3 × 5 with 5 Steps		10 – 1 × 5 with 6 Steps		10 – 5 with 2 Steps		14 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
5,000	94.2 / 93.8	4.1 / 2.9	90.9 / 94.1	3.5 / 1.2	96.0 / 94.8	1.7 / 0.6	93.0 / 94.1	2.1 / 0.7	96.5 / 95.9	0.2 / 0.0
10,000	94.7 / 96.2	4.3 / 1.5	95.1 / 95.6	1.8 / 0.7	98.5 / 95.8	0.5 / 0.2	97.1 / 95.7	0.8 / 1.0	97.7 / 96.4	-0.1 / 0.0
15,000	98.3 / 97.0	0.9 / 0.6	95.4 / 96.2	1.5 / 0.3	99.0 / 96.1	0.1 / 0.4	97.2 / 96.1	1.6 / 0.9	98.0 / 96.8	0.0 / 0.0
20,000	98.8 / 97.4	0.2 / 0.2	98.2 / 96.9	0.6 / 0.5	98.9 / 96.4	0.3 / 0.2	97.7 / 96.6	0.5 / 0.5	98.3 / 97.3	0.0 / 0.1
25,000	99.0 / 97.3	0.1 / 0.2	97.7 / 96.9	0.3 / 0.3	98.9 / 96.9	0.1 / 0.1	98.3 / 97.2	0.5 / 0.2	98.7 / 97.7	-0.0 / 0.0

Table 18: Full results of ablation on corset size m on VisA dataset.

Coreset Size m	1 × 12 with 12 Steps		8 – 1 × 4 with 5 Stepss		8 – 4 with 2 Steps		11 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
10,000	86.5 / 94.5	6.9 / 2.1	93.2 / 95.3	3.2 / 1.3	89.0 / 94.5	3.4 / 1.0	92.3 / 96.2	0.9 / -0.2
20,000	90.6 / 96.1	4.3 / 1.6	95.0 / 96.2	1.3 / 1.0	92.3 / 95.9	1.8 / 1.0	94.8 / 96.8	0.2 / -0.2
30,000	92.6 / 96.8	2.1 / 0.9	95.2 / 96.6	2.1 / 0.7	93.3 / 96.4	1.4 / 0.6	94.8 / 97.1	-0.2 / 0.1
40,000	93.7 / 97.2	0.7 / 0.6	96.3 / 97.2	0.7 / 0.5	93.8 / 96.5	1.2 / 0.8	96.1 / 97.7	0.4 / -0.0
50,000	94.0 / 97.5	0.4 / 0.2	97.0 / 97.4	0.5 / 0.4	94.6 / 97.2	0.5 / 0.2	96.2 / 97.8	0.4 / -0.0

Table 19: Full results of ablation on sampling ratio p on MVTecAD dataset.

Sampling Ratio p	1 × 15 with 15 Steps		3 × 5 with 5 Steps		10 – 1 × 5 with 6 Steps		10 – 5 with 2 Steps		14 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
0.01	98.8 / 97.4	0.2 / 0.2	98.2 / 96.9	0.6 / 0.5	98.9 / 96.4	0.3 / 0.2	97.7 / 96.6	0.5 / 0.5	98.3 / 97.3	0.0 / 0.1
0.05	97.5 / 96.6	1.4 / 1.3	96.6 / 96.7	1.6 / 0.7	98.4 / 96.7	0.9 / 0.3	97.8 / 96.7	0.4 / 0.8	97.5 / 97.1	0.1 / 0.0
0.1	97.1 / 96.8	1.7 / 1.1	96.6 / 96.7	1.6 / 0.7	98.8 / 96.5	0.5 / 0.4	97.8 / 96.7	0.4 / 0.8	97.5 / 97.1	0.1 / 0.0
0.25	97.4 / 96.6	1.5 / 1.4	96.6 / 96.7	1.6 / 0.7	98.9 / 96.6	0.5 / 0.3	97.8 / 96.7	0.4 / 0.8	97.6 / 97.1	0.0 / -0.0
0.5	97.5 / 96.6	1.4 / 1.3	96.6 / 96.7	1.6 / 0.7	98.9 / 96.7	0.5 / 0.3	97.8 / 96.7	0.4 / 0.8	97.6 / 97.1	0.0 / -0.0

Table 20: Full results of ablation on sampling ratio on VisA dataset.

Sampling Ratio p	1 × 12 with 12 Steps		8 – 1 × 4 with 5 Stepss		8 – 4 with 2 Steps		11 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
0.01	93.7 / 97.2	0.7 / 0.6	96.3 / 97.2	0.7 / 0.5	93.8 / 96.5	1.2 / 0.8	96.1 / 97.7	0.4 / -0.0
0.05	92.4 / 96.6	2.7 / 1.1	96.1 / 97.3	1.1 / 0.6	93.9 / 97.0	1.1 / 0.6	95.5 / 97.4	0.1 / -0.1
0.1	91.8 / 96.1	3.2 / 1.5	95.9 / 97.4	1.7 / 0.5	93.9 / 97.0	1.1 / 0.6	95.3 / 97.3	-0.2 / -0.0
0.25	91.8 / 95.7	3.2 / 2.0	95.9 / 97.3	1.7 / 0.5	93.9 / 97.0	1.1 / 0.6	95.3 / 97.4	-0.2 / -0.0
0.5	91.8 / 95.7	3.2 / 2.0	95.9 / 97.3	1.7 / 0.5	93.9 / 97.0	1.1 / 0.6	95.3 / 97.4	-0.2 / -0.0

Table 21: Full results of ablation on online continual on MVTecAD dataset.

Method	1 × 15 with 15 Steps		3 × 5 with 5 Steps		10 – 1 × 5 with 6 Steps		10 – 5 with 2 Steps		14 – 1 with 2 Steps	
	AUROC (↑)	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**	**AUROC (↑)**	**FM (↓)**
DNE $_{ACMMM'22}$ [illegible]	76.3 / -	2.4 / -	70.9 / -	2.6 / -	66.2 / -	1.0 / -	67.2 / -	0.3 / -	64.7 / -	0.2 / -
UCAD $_{AAAI'24}$ [illegible]	91.0 / 83.3	0.0 / 0.8	81.2 / 75.3	0.1 / 1.3	89.9 / 74.7	0.7 / 1.5	78.6 / 77.3	-1.0 / 3.5	80.3 / 70.6	-5.3 / -5.4
IUF $_{ECCV'24}$ [illegible]	69.4 / 78.2	0.1 / 0.2	71.0 / 80.3	0.4 / 0.1	71.9 / 78.9	0.8 / 0.1	72.1 / 81.7	0.0 / 0.1	70.8 / 83.4	0.5 / -0.2
CDAD $_{CVPR'25}$ [illegible]	67.8 / 76.0	2.7 / 0.0	60.4 / 77.0	3.7 / 0.2	62.4 / 77.5	4.7 / 0.0	70.5 / 83.1	-0.9 / 0.1	69.9 / 88.2	0.0 / 0.0
ContCore	**96.7 / 96.7**	**2.1 / 1.2**	**96.3 / 96.4**	**2.5 / 1.[illegible]**	**98.4 / 96.4**	**0.6 / 0.4**	**96.8 / 96.5**	**2.3 / 1.2**	**98.0 / 97.5**	**-0.1 / 0.2**

Table 22: Full results of ablation on online continual on VisA dataset.

Method	1 × 12 with 12 Steps		8 – 1 × 4 with 5 Stepss		8 – 4 with 2 Steps		11 – 1 with 2 Steps	
	AUROC (↑)	FM (↓)	AUROC (↑)	FM (↓)	AUROC (↑)	FM (↓)	AUROC (↑)	FM (↓)
DNE $_{\text{ACMMM'22}}$ [18]	61.7 / 0.0	3.7 / 0.0	62.8 / 0.0	3.2 / 0.0	65.6 / 0.0	5.7 / 0.0	69.7 / 0.0	-0.3 / 0.0
UCAD $_{\text{AAAI'24}}$ [20]	78.3 / 76.9	0.0 / 0.0	75.4 / 79.8	-0.2 / 0.5	66.7 / 73.1	-0.2 / 0.2	78.0 / 73.3	0.7 / 1.0
IUF $_{\text{ECCV'24}}$ [27]	58.0 / 80.4	0.2 / -0.0	57.0 / 84.8	6.0 / 2.7	64.9 / 87.1	-1.4 / 0.9	61.4 / 87.7	-1.2 / 3.2
CDAD $_{\text{CVPR'25}}$ [19]	57.3 / 83.5	0.1 / 0.0	56.3 / 86.2	1.3 / 0.6	60.0 / 86.9	-1.6 / -0.5	61.9 / 93.3	0.9 / 0.9
ContCore	**91.8 / 96.6**	**2.3 / 1.1**	**96.2 / 97.4**	**0.3 / 0.6**	**93.1 / 97.0**	**1.8 / 1.0**	**95.1 / 97.8**	**0.8 / 0.3**

Table 23: Full results of ablation on approximate ratio on MVTecAD dataset.

Approximate Ratio q	1 × 15 with 15 Steps			3 × 5 with 5 Steps			10 – 1 × 5 with 6 Steps			10 – 5 with 2 Steps			14 – 1 with 2 Steps		
	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)
0	98.8 / 97.2	0.3 / 0.2	95	97.2 / 96.7	0.5 / 0.3	131	98.7 / 96.6	0.3 / 0.2	163	97.9 / 96.6	1.3 / 0.6	172	98.4 / 97.5	-0.0 / 0.0	173
0.25	98.8 / 97.3	0.2 / 0.2	90	97.3 / 96.7	0.5 / 0.3	129	98.8 / 96.5	0.4 / 0.2	158	97.2 / 96.7	1.9 / 0.7	169	98.0 / 97.4	0.2 / -0.0	171
0.5	98.3 / 97.2	0.8 / 0.2	83	97.0 / 96.7	0.6 / 0.4	127	98.6 / 96.3	0.5 / 0.3	151	97.5 / 96.7	1.5 / 0.6	167	97.8 / 97.5	0.1 / 0.0	168
0.75	98.8 / 97.4	0.2 / 0.2	79	98.2 / 96.9	0.6 / 0.5	126	98.9 / 96.4	0.3 / 0.2	147	97.7 / 96.6	0.5 / 0.5	165	98.3 / 97.3	0.0 / 0.1	167
1	96.4 / 96.6	0.8 / 0.3	75	95.1 / 95.2	0.7 / 0.4	124	86.9 / 91.0	1.2 / 0.3	142	94.5 / 94.1	1.8 / 1.1	164	72.6 / 91.7	0.7 / 0.0	165

Table 24: Full results of ablation on approximate ratio on VisA dataset.

Approximate Ratio q	1 × 12 with 12 Steps			8 – 1 × 4 with 5 Stepss			8 – 4 with 2 Steps			11 – 1 with 2 Steps		
	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)	AUROC (↑)	FM (↓)	Time (↓)
0	93.3 / 97.2	1.2 / 0.5	372	96.2 / 97.2	1.2 / 0.5	452	94.0 / 97.1	2.1 / 0.5	458	95.7 / 97.5	-0.1 / -0.1	458
0.25	93.2 / 97.3	1.2 / 0.4	352	96.6 / 97.5	1.1 / 0.4	432	94.3 / 97.2	1.5 / 0.2	442	96.0 / 97.5	-0.2 / -0.0	442
0.5	93.4 / 97.2	1.0 / 0.5	333	96.7 / 97.3	0.8 / 0.5	412	94.0 / 97.2	1.9 / 0.2	426	96.0 / 97.6	0.4 / -0.1	427
0.75	93.7 / 97.2	0.7 / 0.6	319	96.3 / 97.2	0.7 / 0.5	399	93.8 / 96.5	1.2 / 0.8	414	96.1 / 97.7	0.4 / -0.0	416
1	90.7 / 96.7	3.8 / 1.0	311	87.1 / 95.8	0.9 / 0.5	391	84.9 / 94.3	2.1 / 0.6	408	91.8 / 96.1	2.8 / 0.0	408

Table 25: Averaged results of MVTecAD dataset with 5 schedules with different sampling methods with (image/pixel) format.

Method	Task AVG	FM
Reservoir	92.2 / 96.5	1.4 / 0.3
Herding	90.1 / 96.3	2.0 / 0.6
Ours	**98.4 / 96.9**	**0.3 / 0.3**

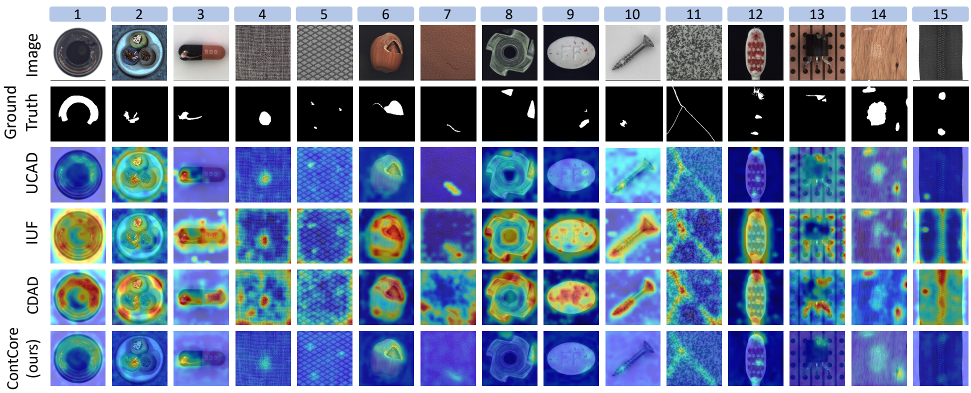


Figure 6: The qualitative results with 1 × 15 task schedule on the MVTecAD dataset.

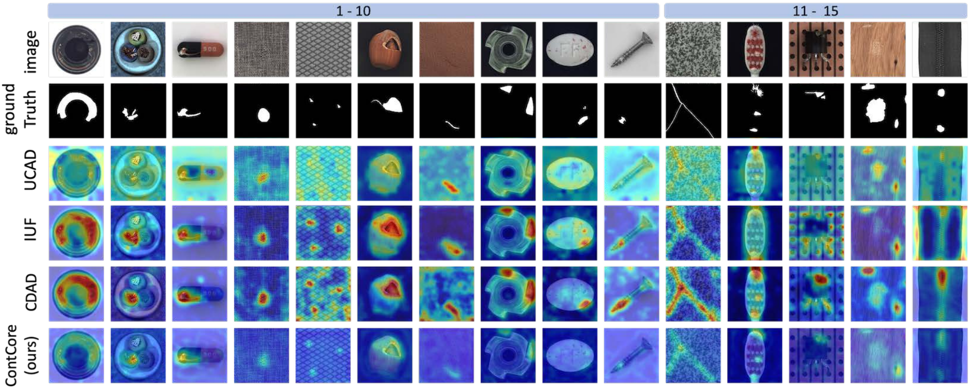


Figure 7: The qualitative results with 10 – 5 task schedule on the MVTecAD dataset.

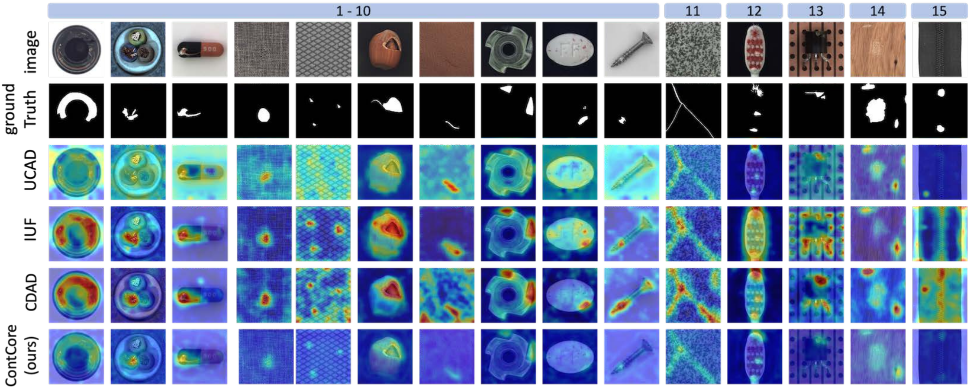


Figure 8: The qualitative results with 10 – 1×5 task schedule on the MVTecAD dataset.

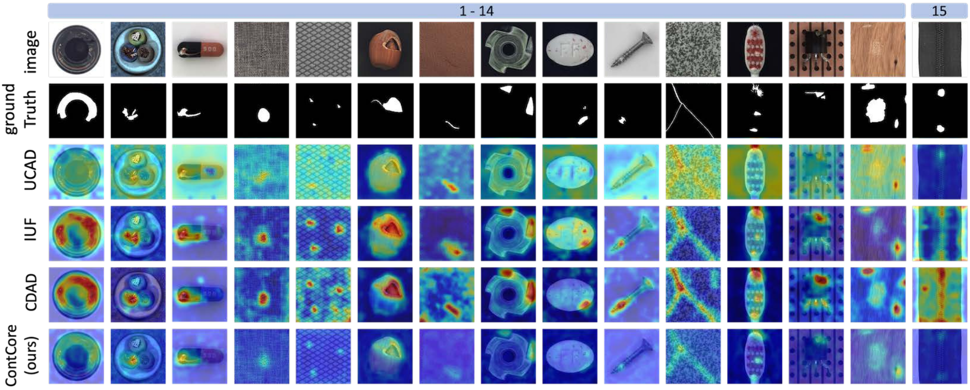


Figure 9: The qualitative results with 14 – 1 task schedule on the MVTecAD dataset.

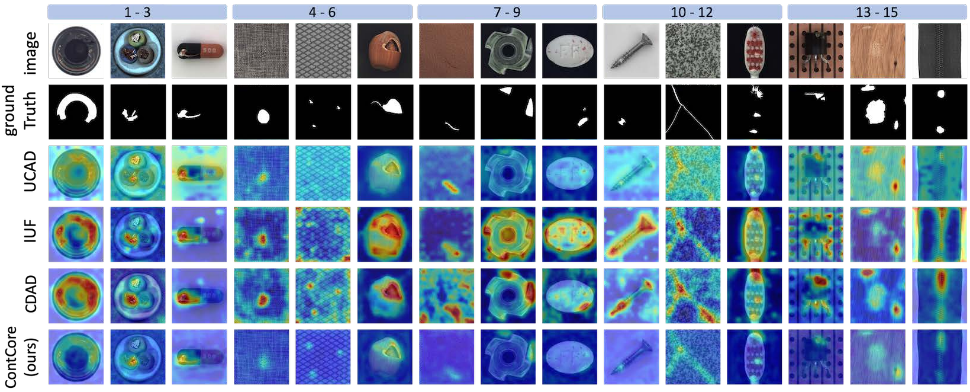


Figure 10: The qualitative results with 3×5 task schedule on the MVTecAD dataset.